Innovation in the
Multi-Screen World

User Manual

Workbench

Create and Customize User Interfaces for Router Control

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1. Introduction

1.1 Description

Workbench provides a unified environment for control and monitoring of Snell and third-party products. It is used to create and customize user interfaces for router control, modular product monitoring and control, and offers highly flexible alarm and status reporting options.

The system is flexible and scalable, providing a range of interfaces from a single router control panel running on a PC, through to large and powerful installations using dual redundant control across many sites. By downloading all relevant data from the database on power up, clients (PCs) and device drivers can operate independently if connection to the database is lost.

Workbench operates in a client-server configuration using standard TCP/IP network protocols, that makes it easy to integrate into existing network infrastructures. Snell and third-party protocols are also used when interconnecting different equipment types.

If required, device drivers can use an embedded, controller with dual redundant power, and run a real-time operating system. This combination offers the ultimate in resilient design.

Individual logins provide access to specific screens, defined by the users login or role, meaning each operator or job function can have dedicated screens for the task in hand.

Workbench is a powerful design tool to design screens for any style of user interface. Every aspect of the user interface can be customized, so that screens can range from clear and functional, to more radical designs for the artistically creative.

1.2 Database Configuration

Choose which installation suits your requirements. Fig 1. and Fig 2. show two typical installation scenarios:

- A distributed installation where the database and SQL server are installed on the server PC, with client PCs that have individual components that connect through the network to the database.
- A stand-alone installation where everything resides on a single PC.

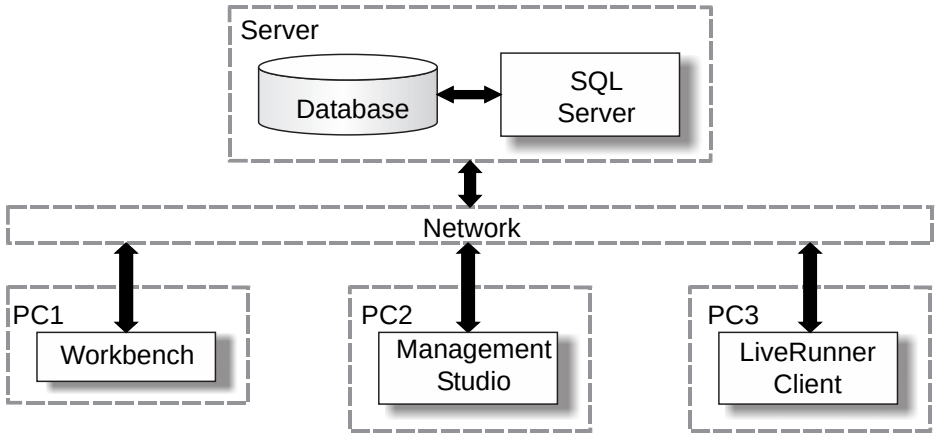

Fig 1. Installation on a Network

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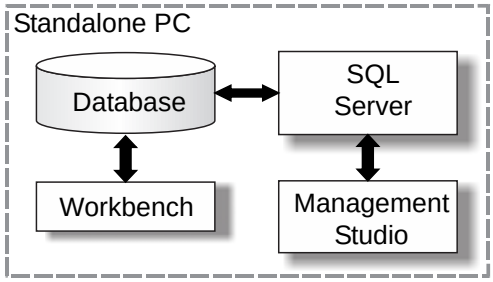

Fig 2. Installation on a Single PC

1.3 Architecture

The physical inputs and outputs of the system can be from numerous individual pieces of hardware. A controller maps the physical inputs and outputs of the router to the software inputs (sources) and outputs (destinations).

A router is a collection of inputs (sources) and outputs (destinations) and crosspoints, that can be on one or more cards, see Fig 3. Each router box has an internal control card for the router to be controlled by a combination of serial or IP interfaces.

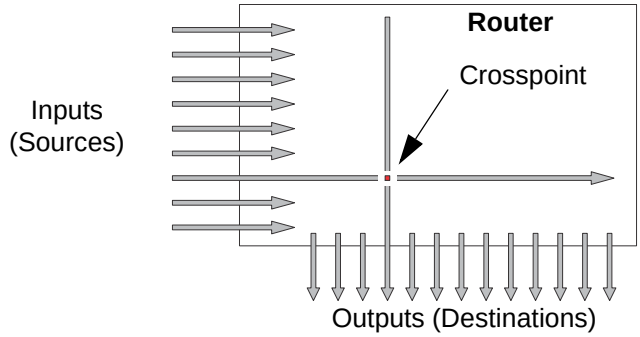

Fig 3. Router Diagram

A level is a logical grouping of inputs and outputs, which may or may not have a direct correspondence with a particular piece of hardware. Typically, a level depends on the operational requirements, and represents groups of inputs and outputs such as video, or audio, or data.

A matrix is a routing system made up of one, or more levels, which is controlled as a single entity, Fig 4.

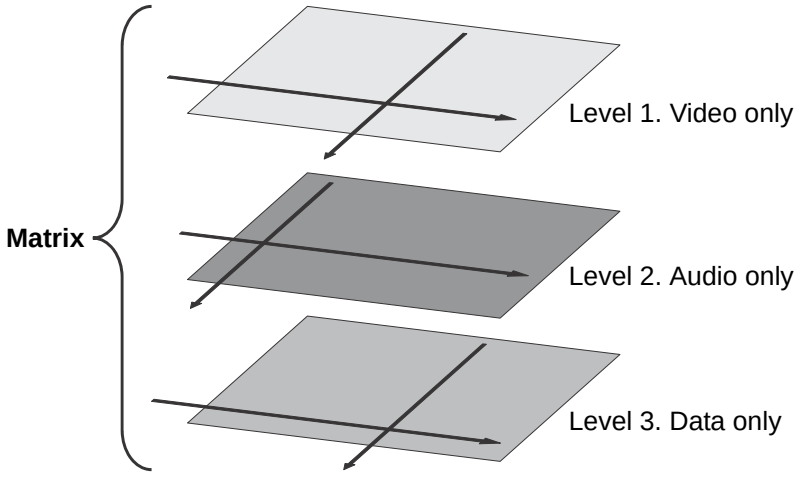

Fig 4. Matrix Diagram

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Associations are a method of grouping together signals so that they can be routed together on a single press of a button. For example, VTR signal levels can be grouped into a single association:

- Level 1 = video
- Level 2 = audio
- Level 3 = control signal

Source Associations refer to the group of sources, and Destination Associations refer to a group of signals at a destination (for example, a monitor). By default, Associations names are derived from the top level name. The Association, Source and Destination names can be changed through the Names Editor. See “Names” on page 53.

1.4 Configurations for Multiple Routers

There are several ways of configuring a series of routers depending on your requirements. For all configurations, Workbench can be connected during operation as a soft panel (GUI) control interface.

Fig 5. shows three routers that are configured so that there is one matrix. The first router is a master, and has a Nucleus controller. The second router, which is connected to the first using SW-P-02 Out protocol, has a Nebula controller and is also a master. The third router has a slave control card, so receives its routing information from the Nebula master controller. The routers are connected to the master through serial connections. Control panels can be connected either serially, or via Ethernet with the Nucleus controller.

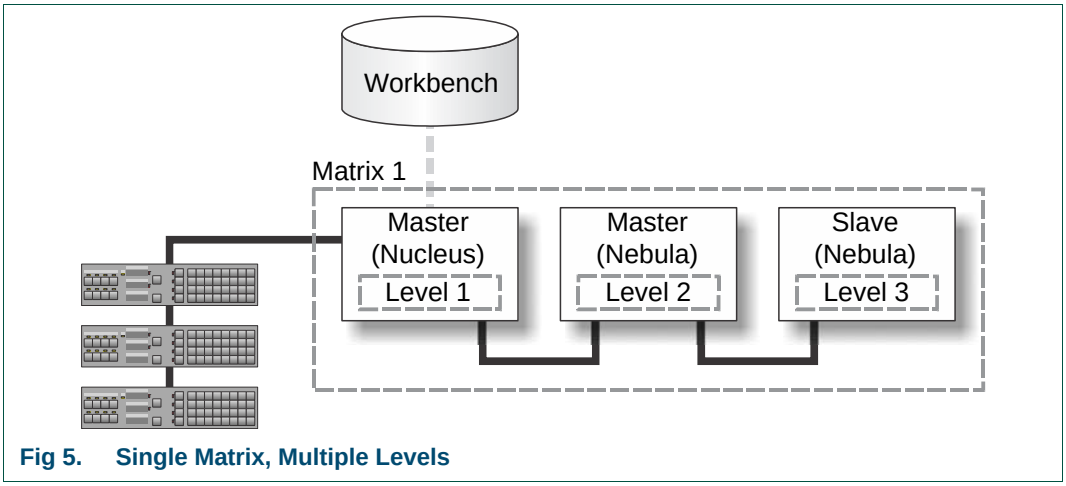

Fig 5. Single Matrix, Multiple Levels

Fig 6. shows three routers, and each has its own matrix. Each router is a master, and has a Nucleus controller. The panels are connected to each master through serial connections. Each router has one or more levels and operates completely independently.

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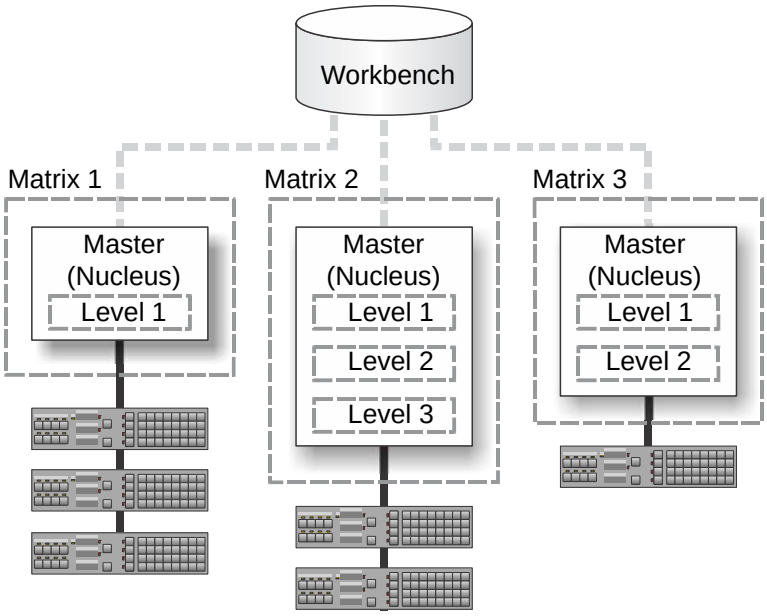

Fig 6. Multiple Matrix, Multiple Levels

Fig 7. shows three routers, and each has its own matrix. Each router is a master, and has a Nucleus controller. The panels are connected to each master through an external 2330 controller. Each router has one or more levels.

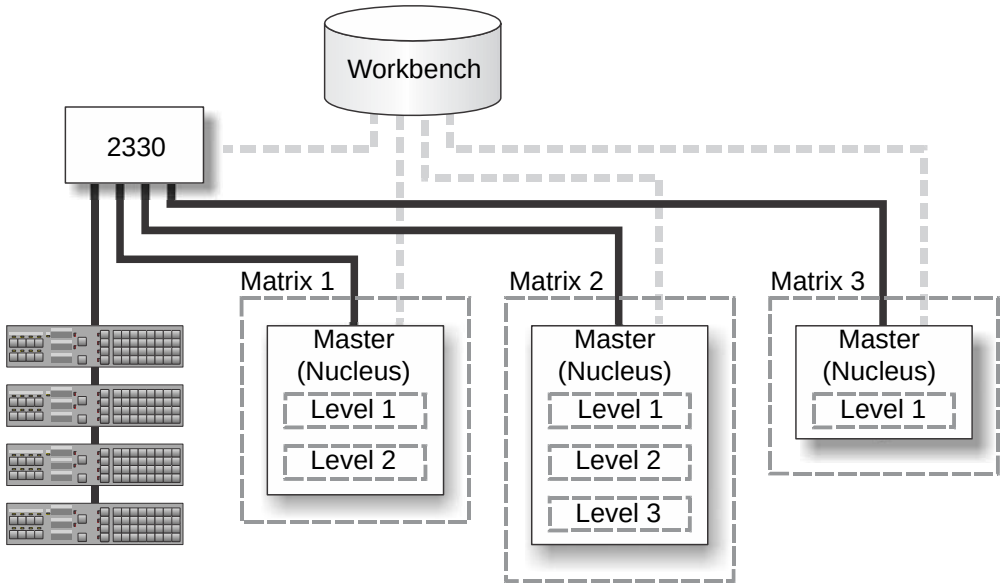

Fig 7. Multiple Matrix, Multiple Levels

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1.5 Protocols

Workbench control systems employ a large number of native and third-party protocols. The following Snell protocols are used in Workbench systems:

- **DCCP** — The Device Configuration and Control Protocol is the primary IP protocol used to configure and control hardware from Workbench.
- **General Switcher (SW-P-02)** — Available on RS232, RS422, or Ethernet in most routers, and is used by 2330 serial router ports for direct control of a router by numerical source and destination. Also router status can be interrogated for missing or faulty modules.
- **General Remote (SW-P-08)** — Available on RS232, RS422, or Ethernet for communication with a control system, or interfacing with automation (third party in some cases). Allows interrogation of source and destination names, and supports all on-line editor messages and diagnostics.
- **Multidrop (SW-P0-6)** — RS422 for communication with a control system allowing up to 16 devices from one multi-drop string. A range of BPX, Dial-up and LCD panels can be connected to the system. UMDs are not directly supported.

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2. Installation

2.1 System Requirements

The Workbench software can run with any screen resolution. However, a resolution of 1920 x 1080 is recommended for Run mode and screen design, and a minimum of 1280 x 1024 for Workbench general configuration.

Specification:

- A PC running MS Windows 7 64-bit (Windows 7 32-bit and XP SP3 or higher 32-bit or 64-bit are also supported)
- A multi-core processor (>2.1 GHz)
- 1 GB RAM minimum (>2 GB RAM recommended)
- Support for DirectX 9 graphics with a WDDM driver, 128 MB of graphics memory (minimum), Pixel Shader 2.0 and 32 bits per pixel

Note: For Windows 7, Administration rights are required for installing Workbench.

System performance is dependent on the PC's available resources. The PC should be as "clean" as possible of other running processes.

2.1.1 Minimum Installation Requirements

For a distributed installation, the minimum installation requirement consists of the mandatory items and the LiveRunner component, see Table 1.

For a standalone installation, the minimum installation consists of the mandatory items and the SQL Server Express component.

2.2 Install Workbench

Note: During the installation, do not close the installation wizard or the Workbench Install Helper. Wait until the entire setup process is complete before exiting the install wizard and Workbench Install Helper.

1. If upgrading, ensure that no Workbench components are running, for example, LiveRunner.
2. Insert the Workbench DVD into the CD-ROM drive. The installation application starts automatically. If it does not, browse to the installation CD-ROM and click **WorkbenchInstaller.exe**.
3. If the Install Checker screen displays, Administration rights may not have been granted on the PC.

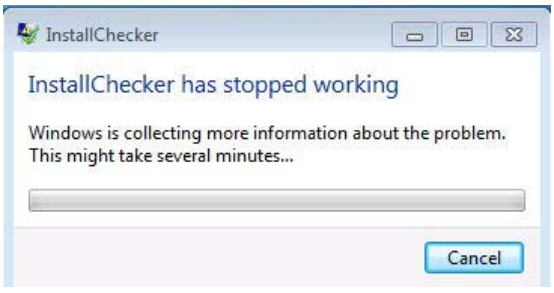

Fig 8. Install Checker Screen

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To run the Configuration Helper, open:

Start | All Programs | Snell | MCM | Utilities | Configuration Helper

- Right-click on Configuration Helper and select “Run as administrator”.

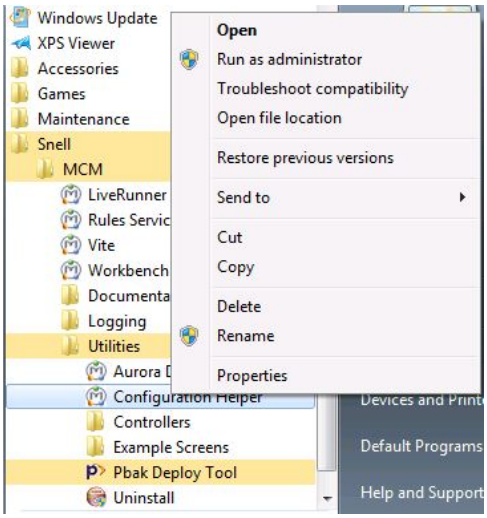

Fig 9. Run as Administrator

4. When using Windows 7, the User Account Control screen displays when starting the installer.

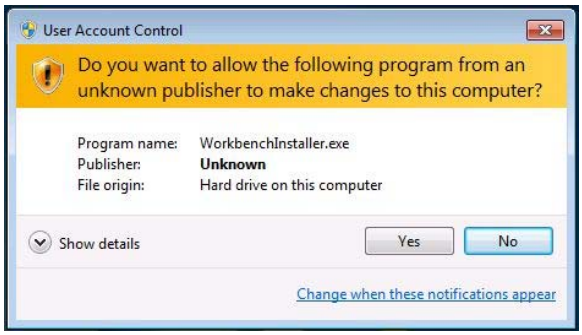
User Account Control
Do you want to allow the following program from an unknown publisher to make changes to this computer?
Program name: WorkbenchInstaller.exe
Publisher: Unknown
File origin: Hard drive on this computer
Show details
Yes
No
Change when these notifications appear

Fig 10. User Account Control

5. Click **Yes** to continue.

6. The Windows Installer screen may display during the installation process.

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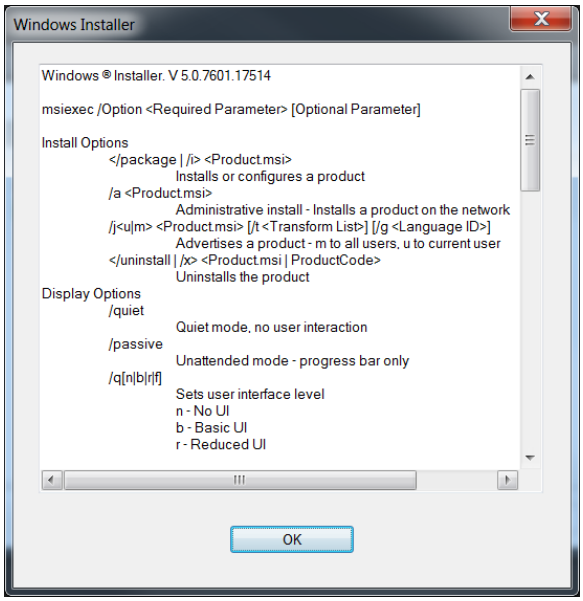

Fig 11. Windows Installer Screen

7. Click **OK**. The installation continues.
8. The end user license agreement (EULA) displays.

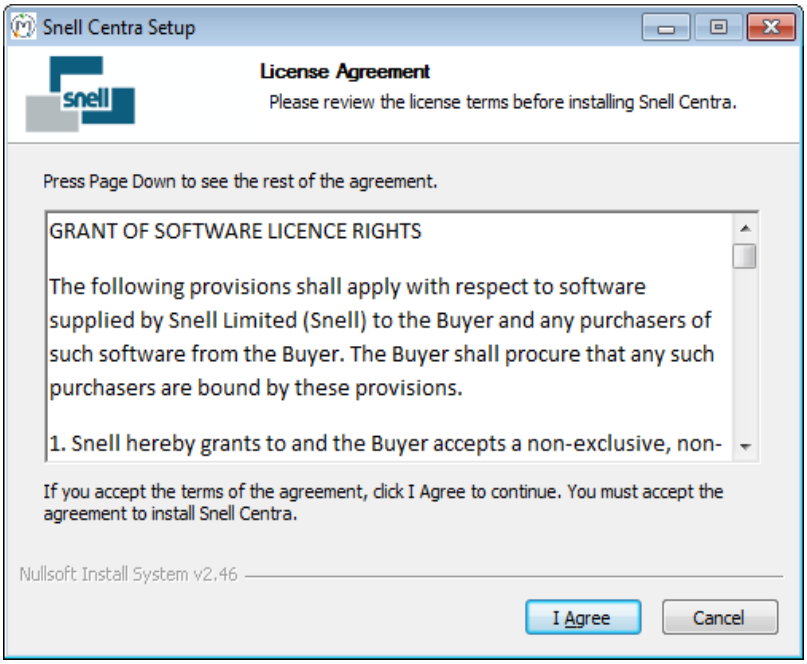
Snell Centra Setup
License Agreement
Please review the license terms before installing Snell Centra.
Press Page Down to see the rest of the agreement.
GRANT OF SOFTWARE LICENCE RIGHTS
The following provisions shall apply with respect to software supplied by Snell Limited (Snell) to the Buyer and any purchasers of such software from the Buyer. The Buyer shall procure that any such purchasers are bound by these provisions.
1. Snell hereby grants to and the Buyer accepts a non-exclusive, non-
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install Snell Centra.
Nullsoft Install System v2.46
I Agree
Cancel

Fig 12. License Agreement

9. Read through the license, and click **I Agree**.

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10. The Choose Components screen displays.

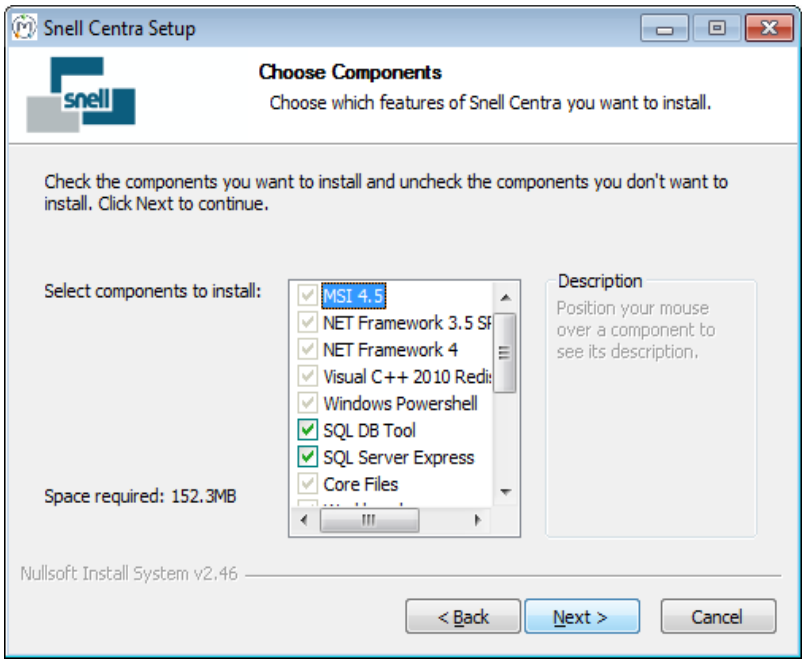
Snell Centra Setup
Choose Components
Choose which features of Snell Centra you want to install.
Check the components you want to install and uncheck the components you don't want to install. Click Next to continue.
Select components to install:
MSI 4.5
NET Framework 3.5 SP
NET Framework 4
Visual C++ 2010 Redi
Windows Powershell
SQL DB Tool
SQL Server Express
Core Files
Description
Position your mouse over a component to see its description.
Space required: 152.3MB
Nullsoft Install System v2.46
< Back
Next >
Cancel

Fig 13. Choose Components

11. Select the Workbench components to install and clear those that are not required for installation. Table 1. lists the available options.

Note: Greyed-out ( ) items are mandatory. The installer checks to see whether the item is already present, and only installs it if it is not found.

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Component	Description	Required for Client	Required for Server
MSI 4.5	Microsoft Windows Installer 4.5	✓	✓
NET Framework 3. 5 SP1	NET Framework 3 5 SP1	✓	✓
NET Framework 4	NET Framework 4	✓	✓
Visual C++ 2010	Visual C++ Redistributable	✓	✓
Windows Powershell	Microsoft's task automation framework that integrates with the .NET Framework	✓	✓
SQLDBTool	Used to backup/restore/create Databases. Can be used in place of the SQL Management Studio		
Core Files	Core Installation files	✓	✓
Workbench	Design and configuration files	✓	
Live Runner	Live control and monitoring	✓	
Rules Server	Rules server application		
Logging Tools	Tools and utilities for viewing and gathering log messages		
Example Resources	Example screen files and database		
Controllers	Windows and embedded controller executable files		
Pbak Deploy Tool	Used to upgrade software on embedded controllers		
Documentation	Manual and Getting Started guide in PDF format		

Table 1. Installation Components

Note: For SQL installation on a server, refer to the **readme.rtf** file on the DVD (MCM\Resources\Installers\readme.rtf) for the various dependencies.

12. Click **Next**.
13. The Install Location screen displays.

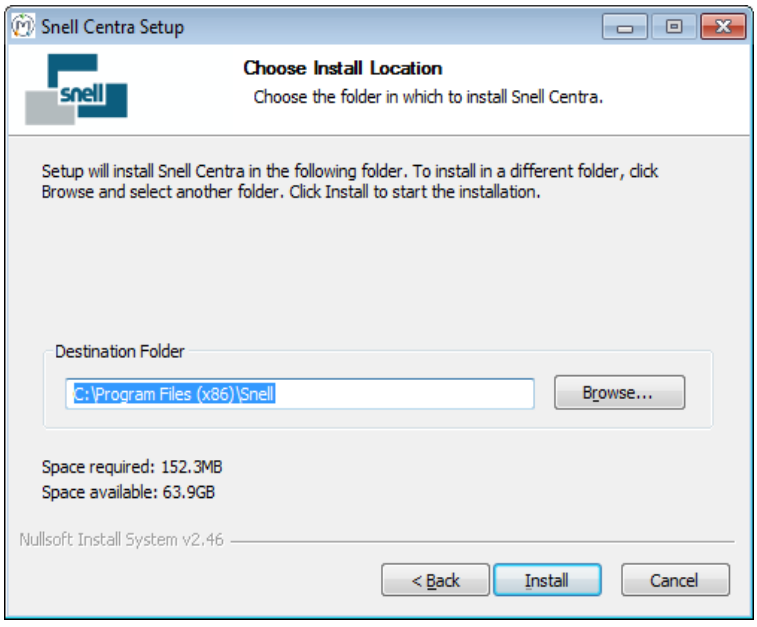
Snell Centra Setup
Choose Install Location
Choose the folder in which to install Snell Centra.
Setup will install Snell Centra in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.
Destination Folder
C:\Program Files (x86)\Snell
Browse...
Space required: 152.3MB
Space available: 63.9GB
Nullsoft Install System v2.46
< Back
Install
Cancel

Fig 14. Install Location

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14. Either accept the default destination or browse to a new destination.

15. Click **Install**. The selected components begin to install.

Note: During the installation, do not close the installation wizard or the Configuration Helper. Wait until the entire setup process is complete before exiting the install wizard and Configuration Helper.

16. Once the installation is almost complete, the Configuration Helper displays in a new window.

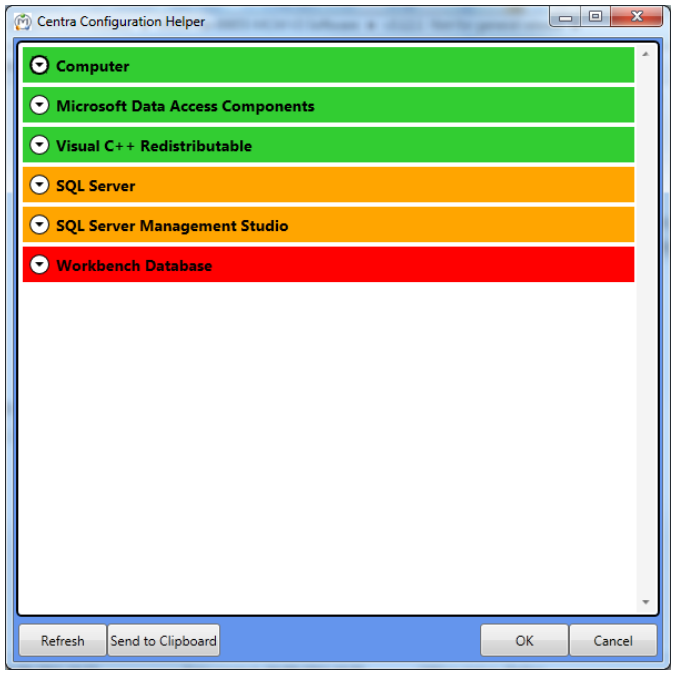

Fig 15. Configuration Helper

The Configuration Helper indicates the status of each of the Workbench components. The components can be in one of three states:

- Green: The component installed correctly.
- Orange: Optional item that has not been installed. (If the Computer component is Orange it indicates that the screen resolution is not high enough).
- Red (yellow during update): Required by Workbench but not yet installed.

17. If the Configuration Helper indicates that all components are installed correctly (green), click **OK**. The Configuration Helper screen closes, and the Completing installation screen displays.

    If the Configuration Helper displays components that have not installed (red) these need to be manually installed before continuing. See Manually Installing Components on page 20.

Note: If Workbench is run while there are components marked as red, an error message displays.

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2.3 Finish the Installation

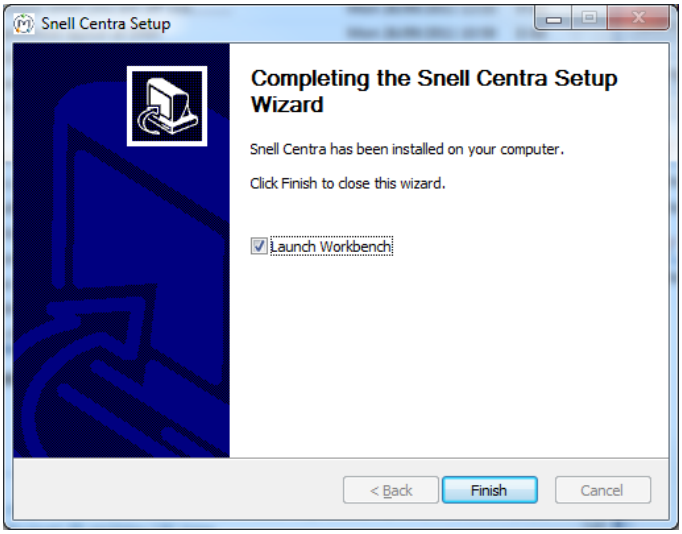

Fig 16. Completing Installation

To stop Workbench starting immediately after installation, uncheck the Launch Workbench checkbox.

- Click **Finish**.

See Start Workbench on page 28.

2.4 Manually Installing Components

2.4.1 Configuration Helper Display

The Configuration Helper graphically shows the installation status of the Workbench Components.

The Configuration Helper is also available from the Windows Start Menu:

Start | All Programs | Snell | MCM | Utilities | Configuration Helper

Each component has information about its status.

- Click on ⊙ to expand each component's details.
- Click on ⊙ to close the component details.

The different components are listed in Table 2.

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Computer	Displays information about the PC on which the Workbench is installed.
Microsoft Data Access Components (MDAC)	Displays information about the MDAC such as installed yes/no, Version number and whether or not the MDAC installation meets the requirements of Workbench.
Visual C++ Redistributable	Displays information about the Visual C++ installation.
SQL server [1]	Displays information about the SQL server such as installed yes/no, version number and type of installation.
SQL Server[1] Management Studio	Displays information about the SQL Server Management Studio.
Workbench Database	Displays information about the Workbench Database and allows connection changes.

Table 2. Workbench Components

[1] Not required for distributed systems.

Note: Until connecting to a Workbench Database, this particular component displays red as, required but not installed. See Fig 17.

2.4.2 Support

If problems occur with the installation at any time contact customer support (customersupport@snellgroup.com).

- Click **Copy to Clipboard**, and paste the current screen information into the email.

2.4.3 Computer

Displays information about the PC on which the Workbench is installed.

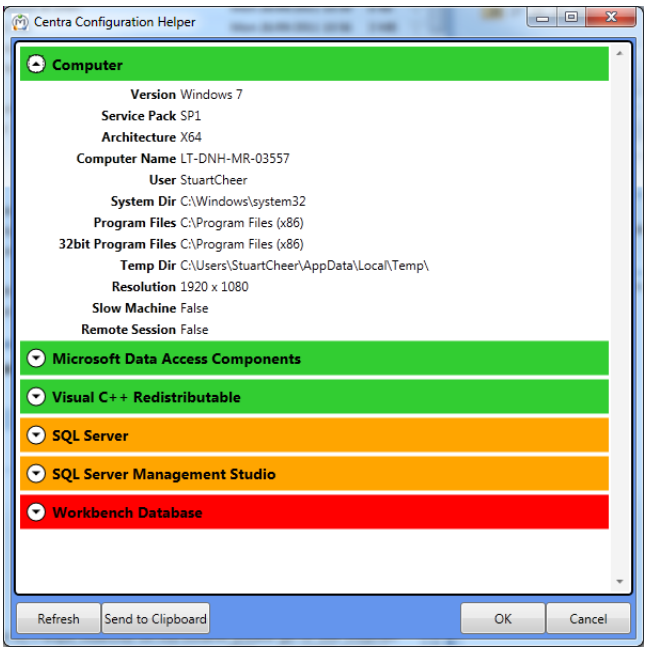

Fig 17. Installed Computer Component

If this component installs but displays orange, check that the PC conforms to the system requirements at the beginning of this guide. See System Requirements on page 14.

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2.4.4 Microsoft Data Access Components

Displays information about the Microsoft Data Access components, for example, version number and installation status.

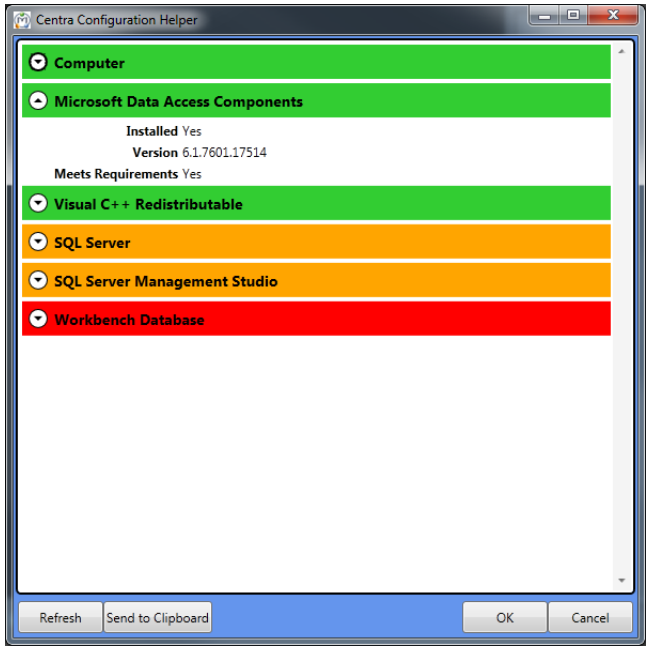

Fig 18. Installed Microsoft Data Access Components

This component is required to run the Workbench. If the component displays as red the installation was incomplete. Restart the installation.

2.4.5 Visual C++ Redistributable

Displays information about the Visual C++ Redistributable component, for example, version number and installation status.

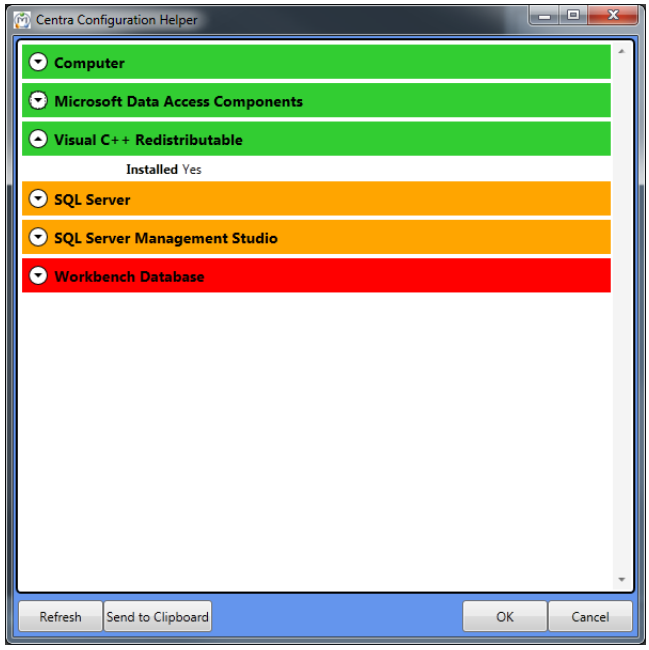

Fig 19. Installed Visual C++ Redistributable Component

This component is required to run the Workbench. If the component displays as red the installation was incomplete. Restart the installation.

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2.4.6 SQL Server

Important: The version of SQL Server on the installation DVD is 2008 R2. If an existing SQL Server 2005 is available, it is not essential to upgrade. However, the sample database on the installation DVD is version 2008 R2 and cannot be imported to the 2005 or 2008 version.

If any version of SQL server is installed, the Configuration Helper displays this component as installed (green).

The SQL Server is optional. For a server installation where the database server is elsewhere on the network, do not install this component.

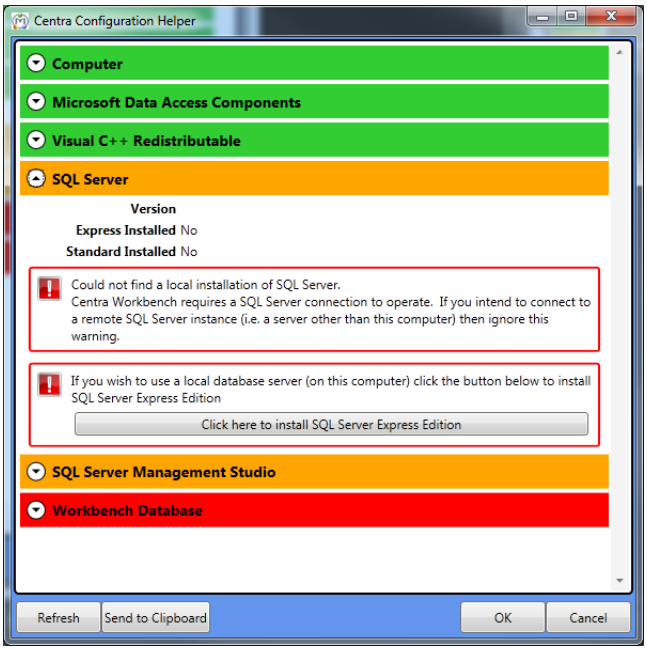
Centra Configuration Helper
Computer
Microsoft Data Access Components
Visual C++ Redistributable
SQL Server
Version
Express Installed No
Standard Installed No
Could not find a local installation of SQL Server.
Centra Workbench requires a SQL Server connection to operate. If you intend to connect to a remote SQL Server instance (i.e. a server other than this computer) then ignore this warning.
If you wish to use a local database server (on this computer) click the button below to install SQL Server Express Edition
Click here to install SQL Server Express Edition
SQL Server Management Studio
Workbench Database
Refresh
Send to Clipboard
OK
Cancel

Fig 20. SQL Server Component

- To install the SQL Server or to upgrade from the 2005 version on a standalone installation, click **Click here to install the SQL Server Express Edition.**

  An install wizard starts and runs through several screens installing both the SQL Server and SQL Server Management Studio. **Do not interrupt the install wizard**.

  Once the wizard is complete, both the SQL Server and SQL Server Management Studio components display green.

2.4.7 SQL Server Management Studio

- To install the SQL Server Management Studio on a server installation, click **Click here to install the SQL Server Management Studio Express Edition.**

For a standalone PC this SQL Server Management Studio component is also installed automatically when the SQL Server wizard is run. See SQL Server on page 23.

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2.4.8 Workbench Database

Important: The Workbench database must be installed on the server. Therefore, unless already installed, install SQL Server Express and SQL Server Management Studio (or optional SQLDBTool) on the server.

Workbench requires a working connection to the Workbench database. Until connected to the database, the Install Helper displays the connection as red (required by Workbench, but not yet installed).

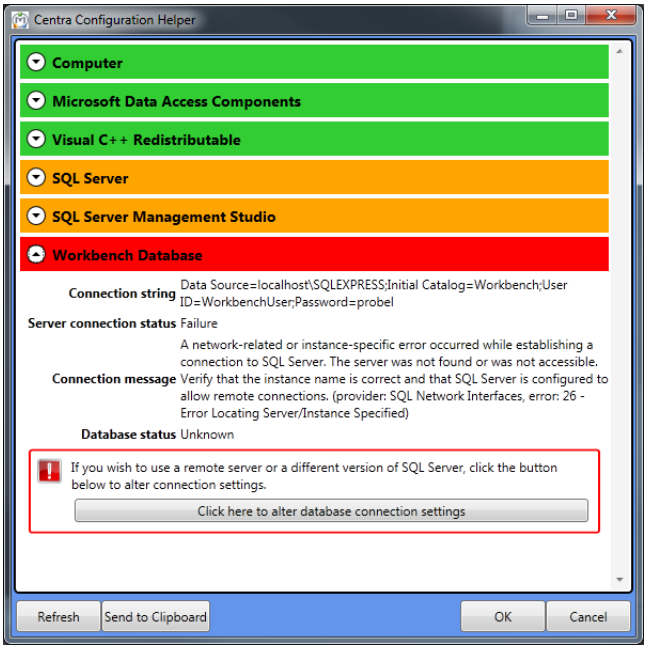
Centra Configuration Helper
Computer
Microsoft Data Access Components
Visual C++ Redistributable
SQL Server
SQL Server Management Studio
Workbench Database
Connection string
Data Source=localhost\SQLEXPRESS;Initial Catalog=Workbench;User ID=WorkbenchUser;Password=probel
Server connection status
Failure
Connection message
A network-related or instance-specific error occurred while establishing a connection to SQL Server. The server was not found or was not accessible. Verify that the instance name is correct and that SQL Server is configured to allow remote connections. (provider: SQL Network Interfaces, error: 26 - Error Locating Server/Instance Specified)
Database status
Unknown
If you wish to use a remote server or a different version of SQL Server, click the button below to alter connection settings.
Click here to alter database connection settings
Refresh
Send to Clipboard
OK
Cancel

Fig 21. Workbench Database

There are two options for connecting to a Workbench database:

- Create a new blank database.
- Connect to an existing database either locally or on the network.

2.4.8.1 Create a New Workbench Database

To create a new Workbench Database:

1. Expand the Workbench Database section.
2. Click **Click here to create databases and permissions**. A command window displays briefly and connects to the database.
3. From the Install Helper, click the **Refresh** button.

   The Workbench Database displays green (installed correctly).

2.4.8.2 Connect to an Existing Workbench Database

If an existing Workbench database is available, provide the file path, and login credentials:

1. Expand the Workbench Database section. Click **Click here to alter database connection settings**.

   The Connection String Editor dialog box displays.

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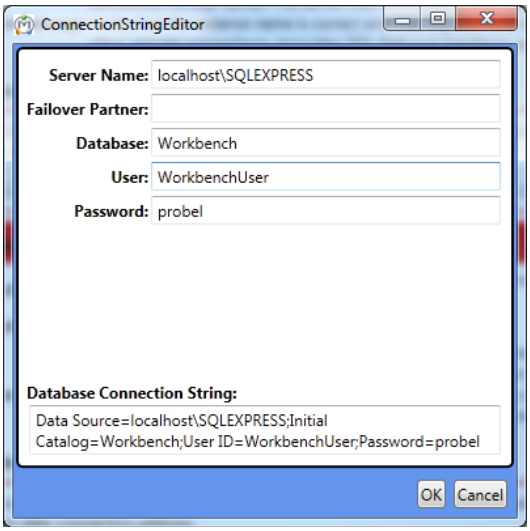

Fig 22. Workbench Database Connection Settings

2. Either, type the server details, or edit the Database Connection String.

Note:

The Server Name can be an IP address or a name. When using SQL Express (the default for a standalone PC) the Server Name must also contain an SQL instance name at the end. For example, the default server name is typically “localhost\SQLEXPRESS”

3. If using a mirrored server, enter Failover Partner backup server details. These details may be added later. See “Add a Mirrored Server” on page 25.
4. Click **OK**.
5. From the Install Helper, click the **Refresh** button.

   The Workbench Database displays green (installed correctly).

2.4.9 Add a Mirrored Server

When using a mirrored server, all changes to the main Workbench configuration database are copied to the backup database on the mirrored server. In the event of the main database being unavailable (through network failure, for example) the backup database on the mirrored server automatically becomes available.

To add a mirrored server to an existing setup:

1. Start the Configuration Helper. The Configuration Helper is also available from the Windows Start Menu:

   Start | All Programs | Snell | MCM | Utilities | Configuration Helper
2. Expand the Workbench Database section.
3. Click **Click here to alter database connection settings**.

   The Connection String Editor dialog box displays.
4. Enter the mirrored server details in the Failover Partner field.
5. Click **OK**.

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2.4.10 Create a New Database Using SQLDBTool

The SQLDBTool simplifies the management of databases. It allows for the creation of new blank databases and the backup and restoring of existing databases.

The SQLDBTool is available from the Windows Start Menu:

Start | All Programs | Snell | SQLDBTOOL | SQLDBTool

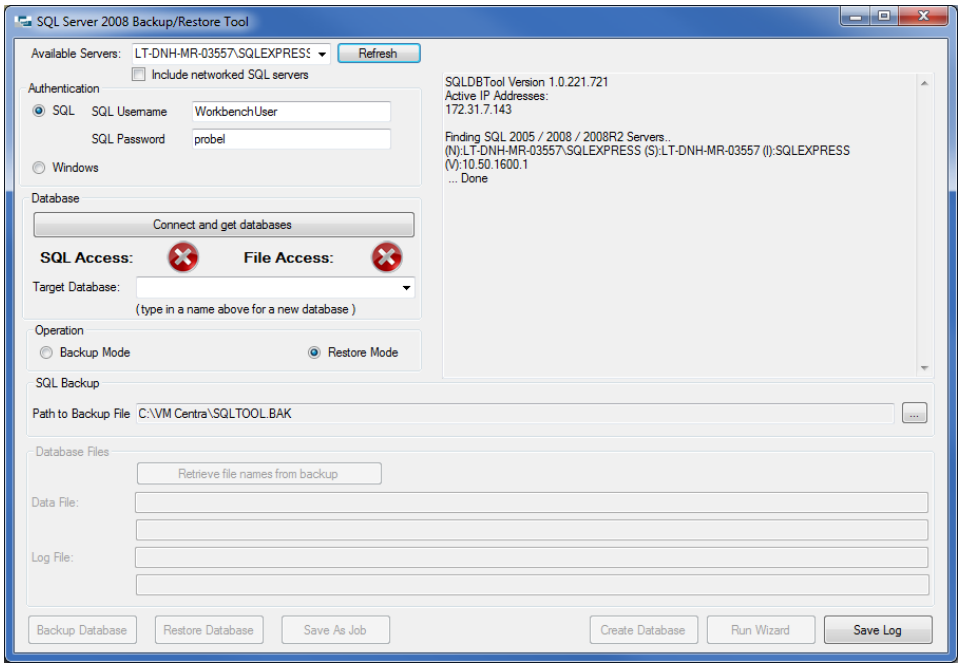

Fig 23. SQLDBTool Screen

1. Select the server name from the drop-down list at the top of the screen.
2. Click **Connect and Get Databases**.
3. Type a name for the new database in the Target Database field.
4. In the Operation section of the screen ensure that the Backup Mode radio button is selected.
5. Browse to the path of where the backup files for the database are to be saved.
6. Click **Create Database**.

No further configuration of this database is required. The Workbench application configures the remainder of the database settings and builds all of the tables.

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2.4.11 Create a Blank Database Using SQLMS

To create a new database SQL Server Express and SQL Server Management Studio must be installed on the server.

To create a new database:

1. Start SQL Server Management Studio. Confirm the server name and login credentials.
2. Right-click the databases node in the object explorer and select **New Database**.
3. Type the name of the database in the **Database** name field (the default is Workbench).
4. Click **OK**.

No further configuration of this database is required. The Workbench application configures the remainder of the database settings and builds all of the tables.

2.4.12 Install Sample Databases

Important:

The sample databases on the installation DVD are SQL version 2008 R2 and cannot be imported to 2005. To install the Workbench databases, upgrade to SQL Server 2008 R2.

When a Workbench database is converted to SQL Server 2008 R2, it is not possible to revert back to SQL Server 2005. Therefore, if using an existing version of the Workbench database, make a full backup before upgrading.

The sample databases each have several example controllers and hardware panels, and are on the installation DVD. To install the sample database:

1. Browse to the installation CD-ROM and open the **Nucleus Default Configurations** folder. The example databases are in .zip folders.
2. Right-click the required .zip file and select **Extract All**… the Extraction Wizard displays. Click **Next**.
3. Browse to an appropriate location for the files, and click **Next**. A .bak file is extracted to the selected location. Click **Finish**.
4. Make sure that Workbench is NOT open.
5. Open SQL server management express and connect to the server.
6. Expand the Databases folder. Right-click on the Workbench database and select **Tasks | Restore | Database**.
7. In the **Source for restore** section, select **From device** and click the (browse) button. The Specify Backup dialog box displays, click **Add**.
8. Locate the .bak file, select it and then click **OK**.
9. In the **Specify Backup** dialog box, click **OK**.
10. Select the file from the **Select the backup sets to restore** section of the Restore Database dialog box.
11. In the **Select a page section**, click **Options**. Select Overwrite the existing database and Leave the database ready to use…(RESTORE WITH RECOVERY).
12. Edit the paths and filenames from the default, accordingly, if required.
13. Click **OK**, and close SQL server management express. The first time that Workbench is started, update the database.

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2.5 Start Workbench

When the Install Helper shows that all the required components have installed correctly, start Workbench.

To start the Workbench, do one of the following:

- Double-click the **Workbench** icon on the desktop.
- Start the program from the Windows Start menu.

  The path to Workbench in the Start menu is:

  Start | All Programs | Snell | MCM | Workbench

The first time that Workbench is started, the database needs to be updated. Fig 24. shows the initial screen. This screen displays when a new version of Workbench is installed, or the database structure has changed. For example, if one of the sample databases is installed.

Important: If this dialog box displays, but no changes have been made, contact the system administrator.

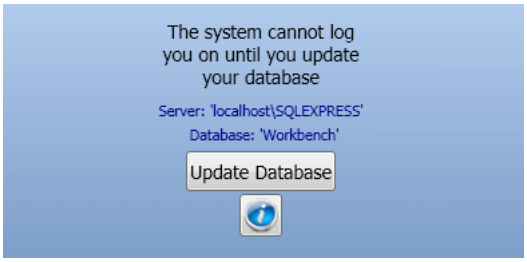
The system cannot log you on until you update your database
Server: 'localhost\SQLEXPRESS'
Database: 'Workbench'
Update Database

Fig 24. Update Database

To view the differences between the databases, click the button. The Database Analyzer displays, indicating the parts of the database that will change when the database updates, see Fig 25.

Note: Workbench cannot start without updating the database.

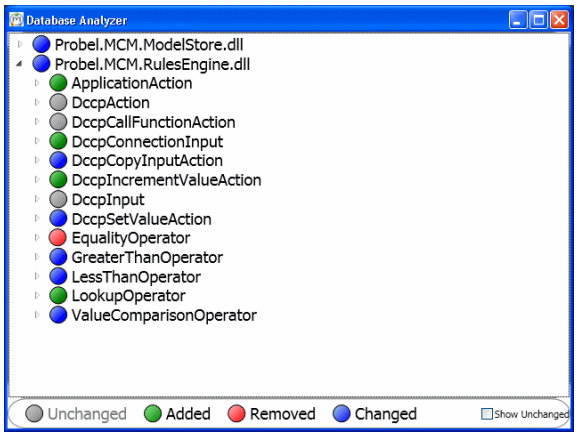

Fig 25. Database Analyzer Example

1. Click **Update Database**.
2. Click **OK**. The login screen displays, see Fig 26.

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Fig 26. Login Screen

2.6 Log In to Workbench

When Workbench is first installed, there is only are two users, see Table 3.

User	Password
admin	admin
user	(none required)

Table 3. Default Users

Note: If no keyboard is attached, click on the keyboard button to display an on-screen keyboard.

1. Type a user name.
2. Type a password, if required.
3. Click **Login** or press the Return key. The home screen displays, see Fig 27.

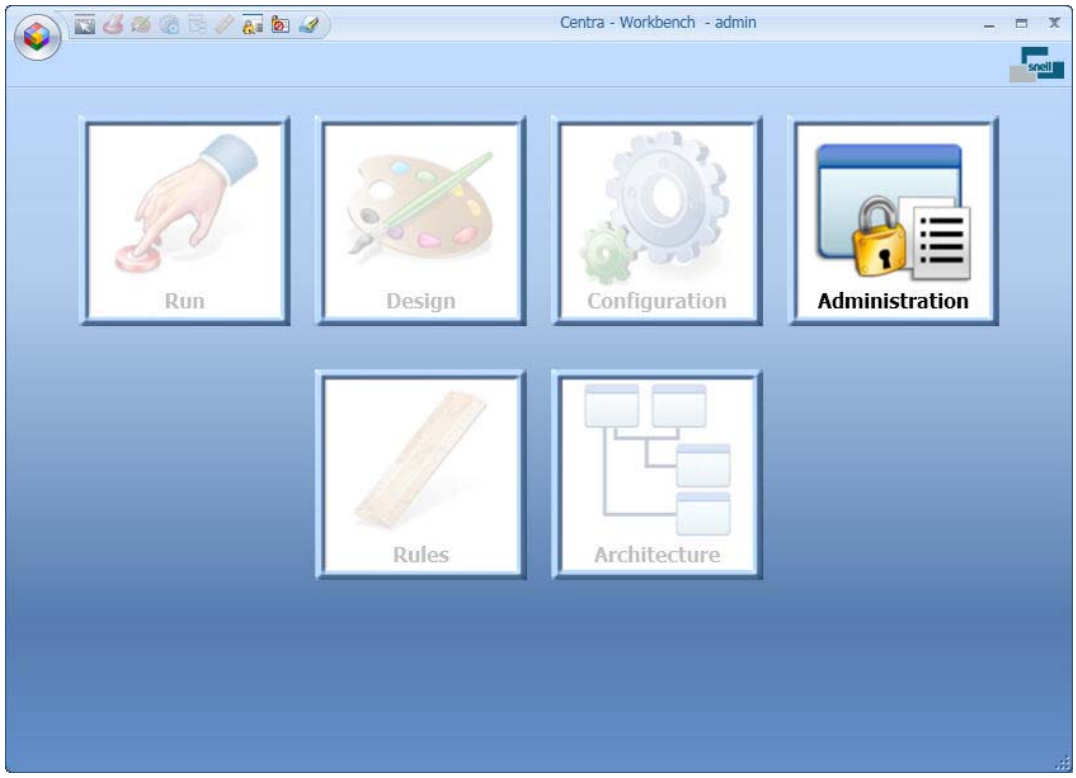

Fig 27. Initial Workbench Administration Screen

See “General Operation” on page 32.

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2.7 LiveRunner

LiveRunner is an optional component of the Workbench installation. LiveRunner is the live control and monitoring (run mode) client allowing a screen to be run without running Workbench.

LiveRunner is available from the Windows Start Menu:

Start | All Programs | Snell | MCM | LiveRunner

The user Login Window displays, see Fig 28.

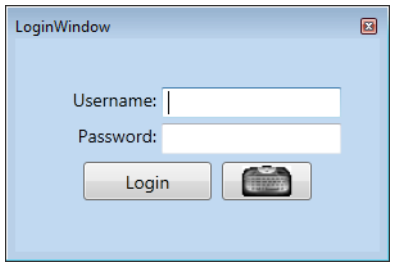

Fig 28. LiveRunner Login

1. Type a user name.
2. Type a password, if required.
3. Click **Login** or press the Return key.

Note: An Initial Screen must be assigned to each user otherwise an error message displays when logging into LiveRunner. This error also displays if trying to enter Run mode.

2.7.1 Command Line Parameters

Command line parameters can be added to the shortcut from LiveRunner. The options are:

-username (or -user or -u) followed by a Workbench user name.

-password (or -pass or -p) followed by the matching Workbench password.

-fullscreen (or -f) = Run in full screen mode

To create a shortcut:

1. From Windows, browse to the Workbench installation folder... \Workbench\LiveRunner.exe.
2. Create a shortcut to LiveRunner.exe.
3. Right-click on the shortcut and select **Properties**.
4. At the end of the **Target** (after the **...LiveRunner. exe”**), type the required command-line parameters.
5. Click **OK**.
6. Double-click the shortcut to open the screen.

Example Shortcut:

"C:\Program Files (x86)\Snell\Workbench\LiveRunner.exe -database "server=localhost\SQLExpress; uid=WorkbenchUser; pwd=probel; database=Centra demo"

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2.8 Pbak DeployTool

2.8.1 Description

The Pbak Deploy tool is used to transfer configuration files to the removable drive on the 2330 and 2450 controller cards. Because other Snell products use the Pbak Deploy tool, the **Dat** and **On Time** tools are not relevant to Workbench.

Important: Whenever Workbench is upgraded, transfer the new configuration file to the controller.

To open Pbak Deploy Tool, from the Windows Start menu browse to:

Start | All Programs | Snell | MCM | Utilities | Pbak Deploy Tool

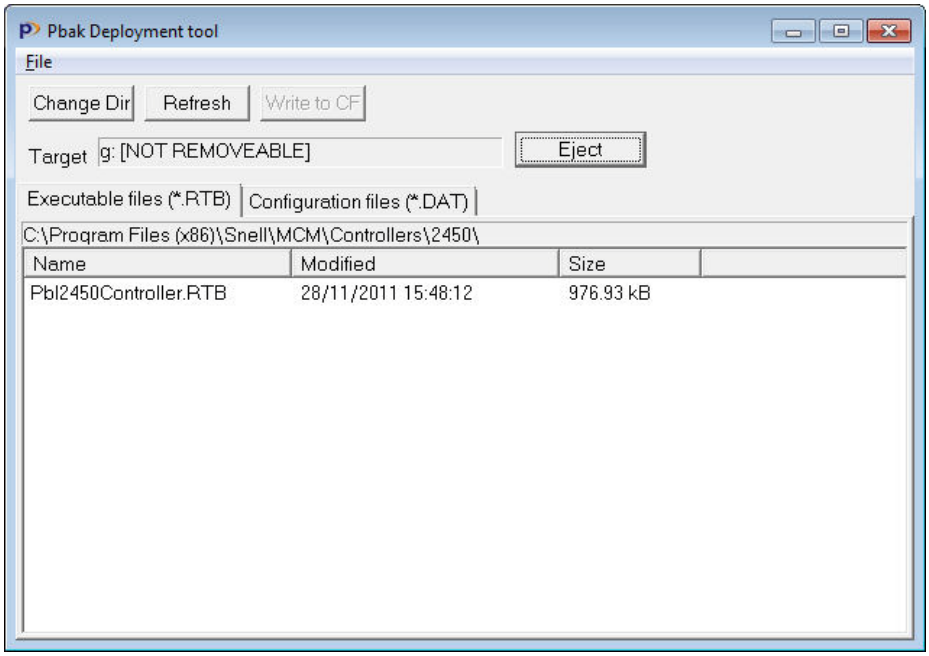

Fig 29. Pbak Deploy Tool

2.8.2 Configuration

Set the Target Drive.

1. Select **File | Configuration**
2. Select the Target Drive from the drop-down list.
3. Set the **RTB directory** on the computer. If the default folders are installed, browse to the folders located in the Workbench installation folder... \MCM\Controllers.

   The **DAT directory** and **On time tools directory** are not relevant for Workbench configuration.

Note: Long network paths should be avoided, otherwise Pbak Deploy may not work correctly.

4. Click **OK**.

2.9 Configuration Helper Utility

The Configuration Helper can be accessed from the Windows Start menu, in case further configuration is necessary after the initial installation:

Start | All Programs | Snell | MCM | Utilities | Configuration Helper

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3. General Operation

3.1 Screen Layout

3.1.1 Home Screen

The home screen displays large icons for easy access to the main modes of the Workbench.

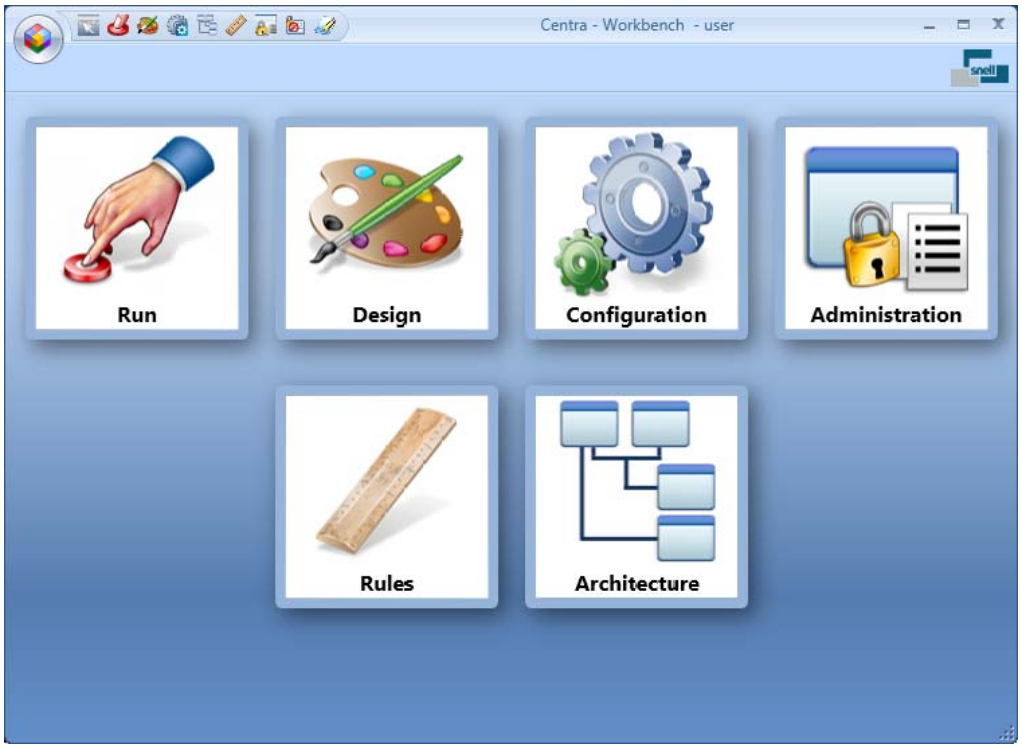

Fig 30. Home Screen

A toolbar at the top of the screen is available in all modes (except Run mode which displays in a new window), and provides quick access from one mode to another without the need to go to the Home Screen each time. In addition, each mode can be selected from the drop-down menu displayed when clicking on the main menu button .

The following modes are available from the Workbench home screen:

Run	displays a new window and displays the interactive screen that has been designed and configured in Workbench
Design	provides the features for constructing interactive panels and screens
Configuration	setup the various controllers necessary for screen interaction, and control of the associated hardware
Administration	define the user privileges and role settings
Rules	define rules that must be fulfilled before actions can be taken
Architecture	capture information on system setup: devices, their inputs and outputs, the cables linking them together and information on the controllers controlling them

Table 4. Home Screen Modes

- Click on the Snell logo at the top-right corner of the home screen to open a window displaying the software version, and links to other useful information.

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3.1.2 Mode Windows

The layout of the mode windows is such that a main working area is displayed on the left of the screen, and menus, or dockable editor windows and tabs, relating to that particular mode are located to the right of the main working area.

3.1.2.1 Docking Windows

Arrange the dockable editors and tabs in Workbench to suit your working practices. Editors can either be floating windows, or docked in different positions around the working area.

If an editor is dragged to a new position without docking, it stays as a floating window.

To move an editor window or tab into a new position:

1. Click and drag the editor. The selected window shows as a colored rectangle, and several position markers show the possible docking positions.
2. Drag the window over the position markers. A colored rectangle indicates the destination position of each marker. Release the editor to dock it in the required position.

Note: Each window as well as the main screen area displays a set of position markers if the selected window is dragged over it. So, a window may be docked within the main screen area, within the area of, or directly over, an existing editor window.

Docking an editor window directly over an existing window, causes the two windows to be tabbed allowing selection of either of them.

Fig 31. shows how to move an editor to a new docked position.

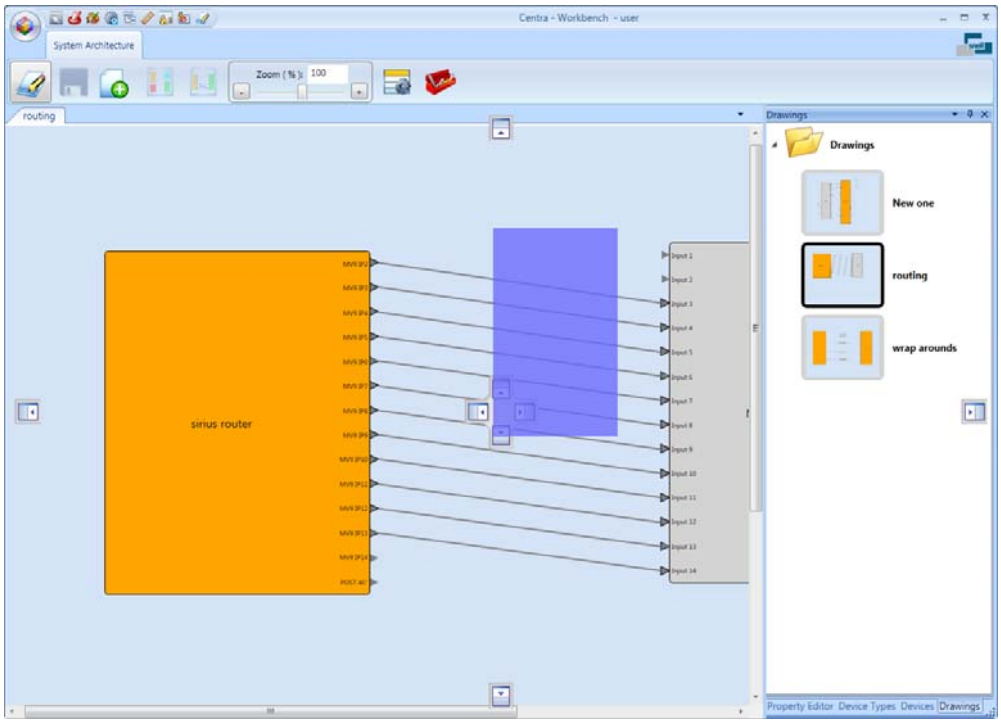

Fig 31. Docking Windows

Editors can be pinned to the edge of the screen so that they become tabbed windows.

- To pin an editor or tab to the right-hand edge of the window, click the button.
- To restore the editor, click the button.

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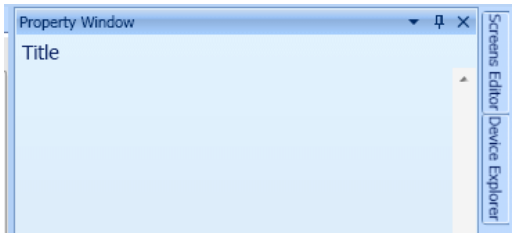

Fig 32. Pin Windows

3.1.2.2 Closing an Editor

- To close an editor, click the button.
- To restore an editor, click the button and select the editor to restore. The editor displays back in the position from where it was deleted.

Note: If other editors have been moved since deleting an editor, the restored editor displays as close to the previous position as possible.

3.2 Run Screen

When all the configuration, design of panels, and actions are defined, the Run screen is used to control the associated hardware via the interactive screen that has been created.

- Click to open the Run screen.

  The Run Screen has no menus. It can only be used as defined, and then closed when not in use.

- To close the Run screen, click the button, or press F4.

  This does not close Workbench.

3.3 Change User

- To log in as a different user, click the Logout button

  The login screen displays, see Fig 33.

Fig 33. Login Screen

1. Type a user name.
2. Type a password, if required.
3. Click **Login** or press the Return key.

   The home screen displays.

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3.4 Log

- To show the log file, click the **Log** button

  The log file, showing all online events since the start of the current session, displays in a Windows Notepad window.

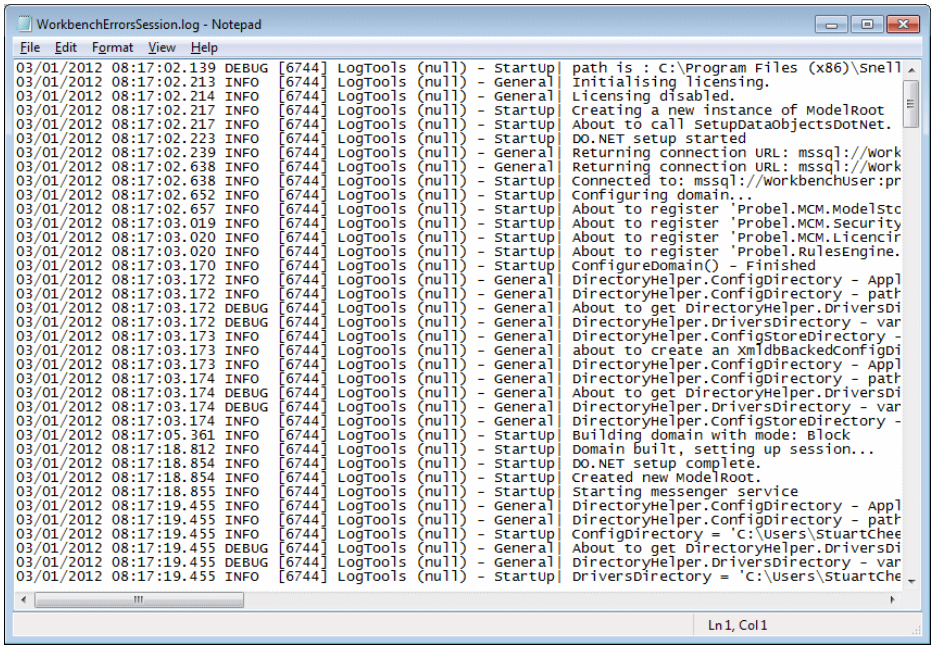
WorkbenchErrorsSession.log - Notepad
File Edit Format View Help
03/01/2012 08:17:02.139 DEBUG [6744] LogTools (null) - StartUp| path is : C:\Program Files (x86)\Snell
03/01/2012 08:17:02.213 INFO [6744] LogTools (null) - General| Initialising licensing.
03/01/2012 08:17:02.214 INFO [6744] LogTools (null) - General| Licensing disabled.
03/01/2012 08:17:02.217 INFO [6744] LogTools (null) - StartUp| Creating a new instance of ModelRoot
03/01/2012 08:17:02.217 INFO [6744] LogTools (null) - StartUp| About to call SetupDataObjectsDotNet.
03/01/2012 08:17:02.223 INFO [6744] LogTools (null) - StartUp| DO.NET setup started
03/01/2012 08:17:02.239 INFO [6744] LogTools (null) - General| Returning connection URL: mssql://Work
03/01/2012 08:17:02.638 INFO [6744] LogTools (null) - General| Returning connection URL: mssql://Work
03/01/2012 08:17:02.638 INFO [6744] LogTools (null) - StartUp| Connected to: mssql://WorkbenchUser:pr
03/01/2012 08:17:02.652 INFO [6744] LogTools (null) - StartUp| Configuring domain...
03/01/2012 08:17:02.657 INFO [6744] LogTools (null) - StartUp| About to register 'Probel.MCM.ModelStc
03/01/2012 08:17:03.019 INFO [6744] LogTools (null) - StartUp| About to register 'Probel.MCM.Security
03/01/2012 08:17:03.020 INFO [6744] LogTools (null) - StartUp| About to register 'Probel.MCM.Licencir
03/01/2012 08:17:03.020 INFO [6744] LogTools (null) - StartUp| About to register 'Probel.RulesEngine.
03/01/2012 08:17:03.170 INFO [6744] LogTools (null) - StartUp| ConfigureDomain() - Finished
03/01/2012 08:17:03.172 INFO [6744] LogTools (null) - General| DirectoryHelper.ConfigDirectory - Appl
03/01/2012 08:17:03.172 INFO [6744] LogTools (null) - General| DirectoryHelper.ConfigDirectory - path
03/01/2012 08:17:03.172 DEBUG [6744] LogTools (null) - General| About to get DirectoryHelper.DriversDi
03/01/2012 08:17:03.172 DEBUG [6744] LogTools (null) - General| DirectoryHelper.DriversDirectory - var
03/01/2012 08:17:03.173 INFO [6744] LogTools (null) - General| DirectoryHelper.ConfigStoreDirectory -
03/01/2012 08:17:03.173 INFO [6744] LogTools (null) - General| about to create an XmlDbBackedConfigDi
03/01/2012 08:17:03.173 INFO [6744] LogTools (null) - General| DirectoryHelper.ConfigDirectory - Appl
03/01/2012 08:17:03.174 INFO [6744] LogTools (null) - General| DirectoryHelper.ConfigDirectory - path
03/01/2012 08:17:03.174 DEBUG [6744] LogTools (null) - General| About to get DirectoryHelper.DriversDi
03/01/2012 08:17:03.174 DEBUG [6744] LogTools (null) - General| DirectoryHelper.DriversDirectory - var
03/01/2012 08:17:03.174 INFO [6744] LogTools (null) - General| DirectoryHelper.ConfigStoreDirectory -
03/01/2012 08:17:05.361 INFO [6744] LogTools (null) - StartUp| Building domain with mode: Block
03/01/2012 08:17:18.812 INFO [6744] LogTools (null) - StartUp| Domain built, setting up session...
03/01/2012 08:17:18.854 INFO [6744] LogTools (null) - StartUp| DO.NET setup complete.
03/01/2012 08:17:18.854 INFO [6744] LogTools (null) - StartUp| Created new ModelRoot.
03/01/2012 08:17:18.855 INFO [6744] LogTools (null) - StartUp| Starting messenger service
03/01/2012 08:17:19.455 INFO [6744] LogTools (null) - General| DirectoryHelper.ConfigDirectory - Appl
03/01/2012 08:17:19.455 INFO [6744] LogTools (null) - General| DirectoryHelper.ConfigDirectory - path
03/01/2012 08:17:19.455 INFO [6744] LogTools (null) - StartUp| ConfigDirectory = 'C:\Users\StuartChee
03/01/2012 08:17:19.455 DEBUG [6744] LogTools (null) - General| About to get DirectoryHelper.DriversDi
03/01/2012 08:17:19.455 DEBUG [6744] LogTools (null) - General| DirectoryHelper.DriversDirectory - var
03/01/2012 08:17:19.455 INFO [6744] LogTools (null) - StartUp| DriversDirectory = 'C:\Users\StuartChe
Ln 1, Col 1

Fig 34. Exit Screen

3.5 Exit Workbench

- Click the button.

  A dialog box prompting for confirmation displays.

Fig 35. Exit Confirmation Screen

- Click **Yes** to exit, or **No** to return to Workbench.

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4. Administration

4.1 Description

Administration of Workbench: how to add new users, roles, and permissions. Users belong to groups based upon roles, which are assigned permissions that support their operational needs. For example, access for all control operators, or engineers may be grouped together.

- A Role defines the functions of a group of users.
- A User defines a system user belonging to one or more roles.

When Workbench is first installed, there are two users, see Table 5.

User	Password	Roles
admin	admin	Everyone Administrators
user	(none required)	Everyone Users Administrators

Table 5. Default Users

4.2 Users

The Users tab is for adding and deleting users from the Workbench system. It also lists the roles of each user.

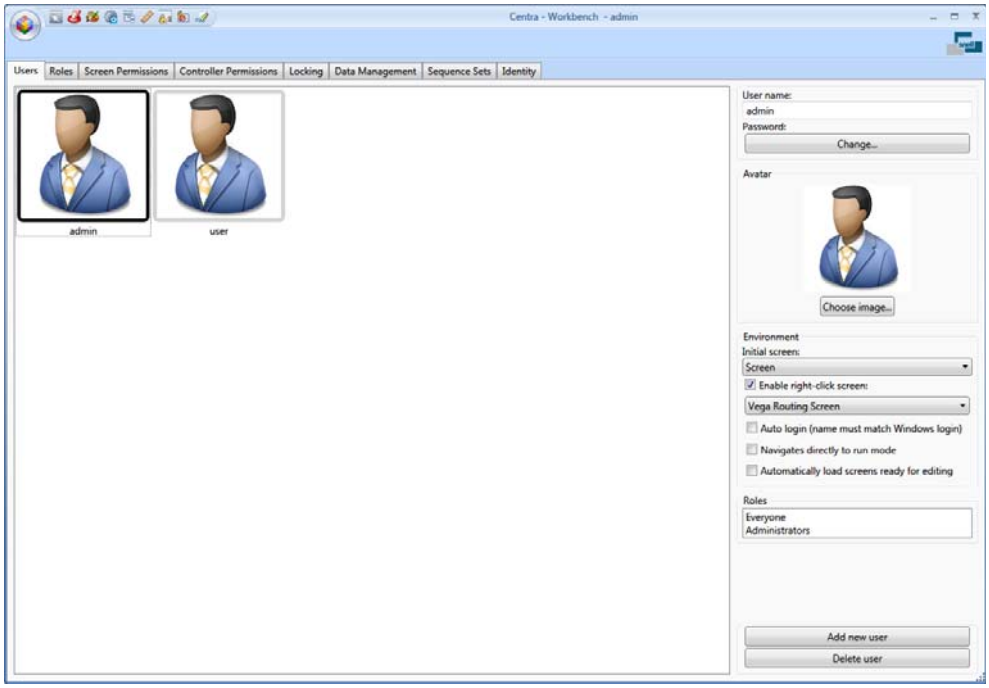

Fig 36. Users

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4.2.1 Add a New User

To add a new user:

1. From the Home screen or menu, click **Administration**.
2. If it is not already displayed, click the **Users** tab.
3. Click **Add new user**. A new user icon is added to the list of users.
4. In the **User Name** field, type a user name (the user name is not case-sensitive).

Set a new password:

1. Click the **Change** button. A Change Password dialog box displays. In the **Password** field, type a password, and then type it again in the **Confirm** field. The passwords typed in the two fields must be identical. Passwords are case-sensitive. Blank passwords are allowed, but are not recommended. Click **OK**.
2. If required, select an **Avatar**. This is an image that represents the user. Click the **Choose image** button, and browse to the image.
3. Select an **Initial screen**. When the user logs on to Workbench, and selects **Run**, this is the screen that displays. See “Screens Editor” on page 110.

   A second screen may be setup such that it runs on a right-click of the mouse in run mode. If required, check the **Enable right-click screen** checkbox, and select a screen from the drop-down list.

Note: If this is the initial set up of users and there are no screens available, ignore this step and assign an initial screen later.

4. If the Workbench user name is identical to the windows login, select **Auto login** to log the user in to Workbench without the need to enter a user name.

Note: If the Auto Login option is selected, to change user, click the **Home** button and click **Log Out**. Enter a new username.

5. To start Workbench in run mode when logging in, select **Navigates directly to run mode**.

Note: An Initial Screen must be assigned otherwise an error message displays when Run mode is started.

6. To open screens in edit mode in the Design area, select **Automatically load screens ready for editing**.

4.2.2 Delete a User

To delete a user:

1. Select the user from the list of users on the left.
2. Click **Delete User**.
3. In the confirmation Window, click **Yes**.

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4.3 Roles

The Roles tab is for the administrator to assign permissions for each user depending on operational needs. For example, roles can be created for central control room operators or system administrators.

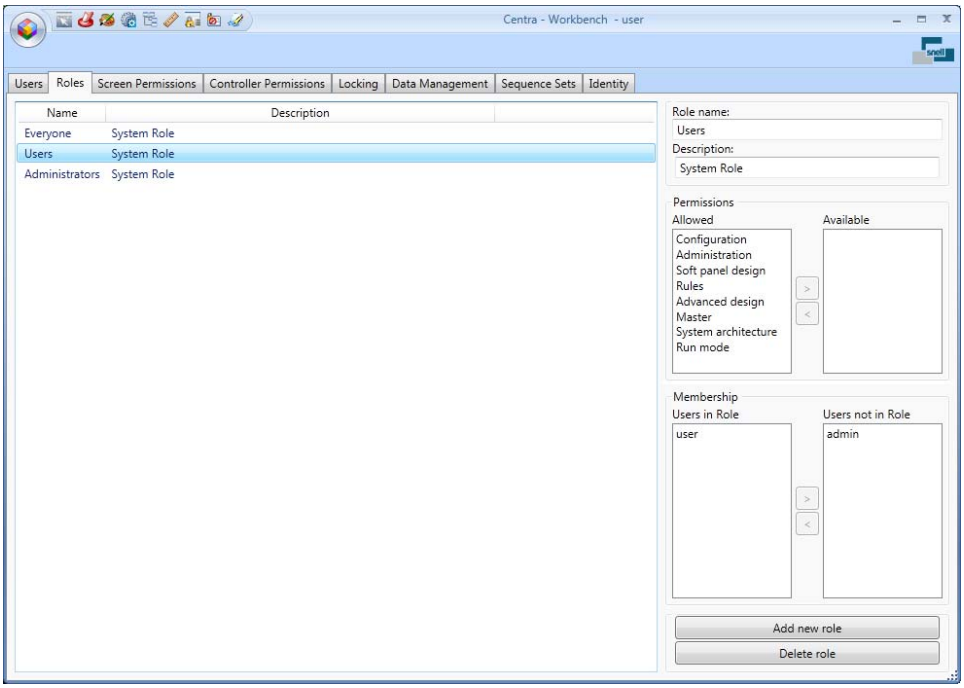

Fig 37. Roles

4.3.1 Default Roles

For a new installation, there are three Roles, see Table 6.

Role	Permissions	Memberships
Everyone	No permissions are assigned	admin user
Users	Run Mode only	user
Administrators	Soft panel design Run Mode Configuration Administration	admin user

Table 6. Default Roles

4.3.2 Add a New Role

To add a new role:

1. Click **Add new role** a new role named ‘New Role 0’ is added to the list of roles on the left side of the window.
2. In the **Role Name** field type a name for the new role. For example, Operators.
3. If required, type a brief description of the role in the **Description** field.
4. Assign **Permissions** to the role.
5. Permissions to Workbench system functions are granted to roles, as opposed to specific users. The Permissions section on the Roles tab has two lists, **Allowed** and **Available**. Table 7. lists the actions for each permission:

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Permission	Action
Administration	Provides access to the administration functions.
Advanced Design	Advanced Design provides access to additional properties in the design section. For example, visibility of button code information when working with hardware panels. **Note**: The Advanced buttons on the design toolbar are not related to this permission. That is, if a role has the Soft Panel Design permission, but does not have the Advanced Design permission, the Advanced buttons are still available.
Configuration	Permits viewing and editing of the controller Configuration section.
Master	The Master permission is intended to allow the user to perform operations that override other user's actions. It is currently only used for routing panels, specifically destination protect functionality. A user with Master permission can take over protection of a destination protected by another user.
Push Configuration	Allows configuration settings to be pushed to a controller. Pushing a configuration to a controller can have serious consequences if not done correctly, so this permission should be limited to a small number of users.
Rules	Permits access to the Rules section.
Run mode	Permits access to the Run mode.
Soft panel design	Permits access to the Soft Panel design (sufficient for most designers).
System Architecture	Permits access to the System Architecture section.

Table 7. Permissions

4.3.3 Membership

Once roles and their associated permissions are defined, assign individual users to the roles. The Users not in Role list shows those users that are not members of the selected role, but that may be assigned to it.

To add members to a role:

1. In the list of roles on the left side of the window, click on the role to assign members to.
2. Use the arrow buttons (**<** and **>**) to move members to and from the role as required.

Note: A user can belong to any number of Roles (the permissions are combined).

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4.4 Screen Permissions

The Screen Permissions tab is for assigning access to the different screens on the system. Permission can be allocated to a Role or to individual users.

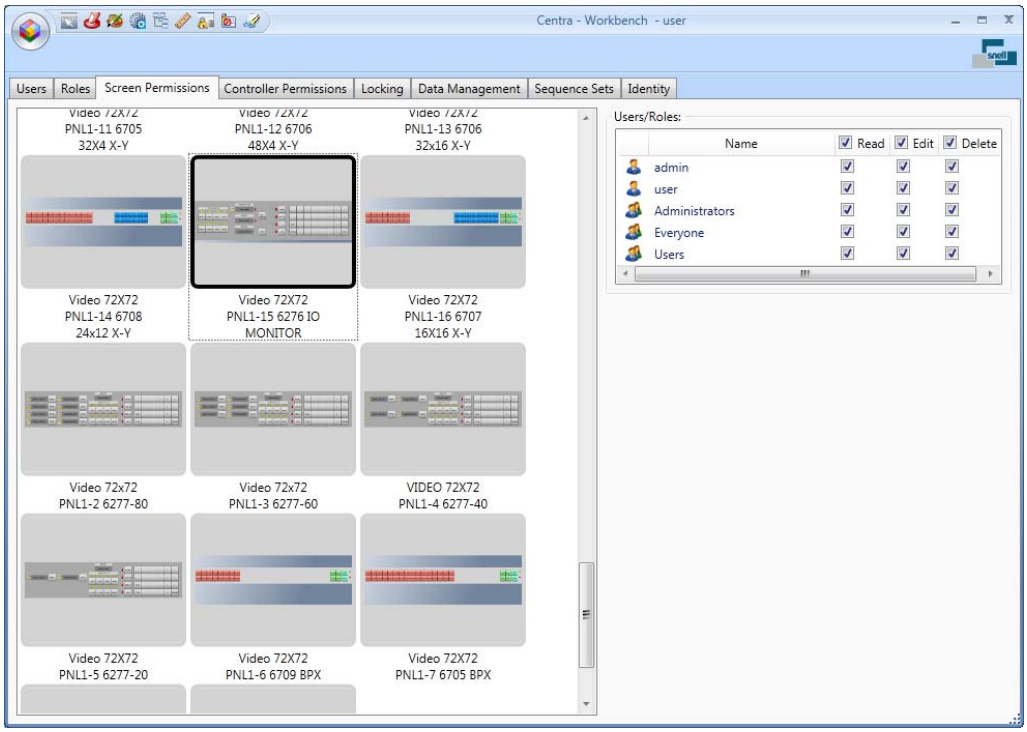

Fig 38. Screen Permissions

Permission has three levels:

- **Read**: The basic level of access, allowing read only permission. It is required for visibility in Run mode.
- **Edit**: Enables screen modification in Design mode.
- **Delete**: Allows the user to remove the screen.

To allocate a permission, check the appropriate box.

Selecting Edit automatically selects Read permissions, and selecting Delete automatically selects Read and Edit permissions.

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4.5 Controller Permissions

The Controller Permissions tab is for assigning access to the different controllers on the system. Permission can be allocated to a Role or to individual users.

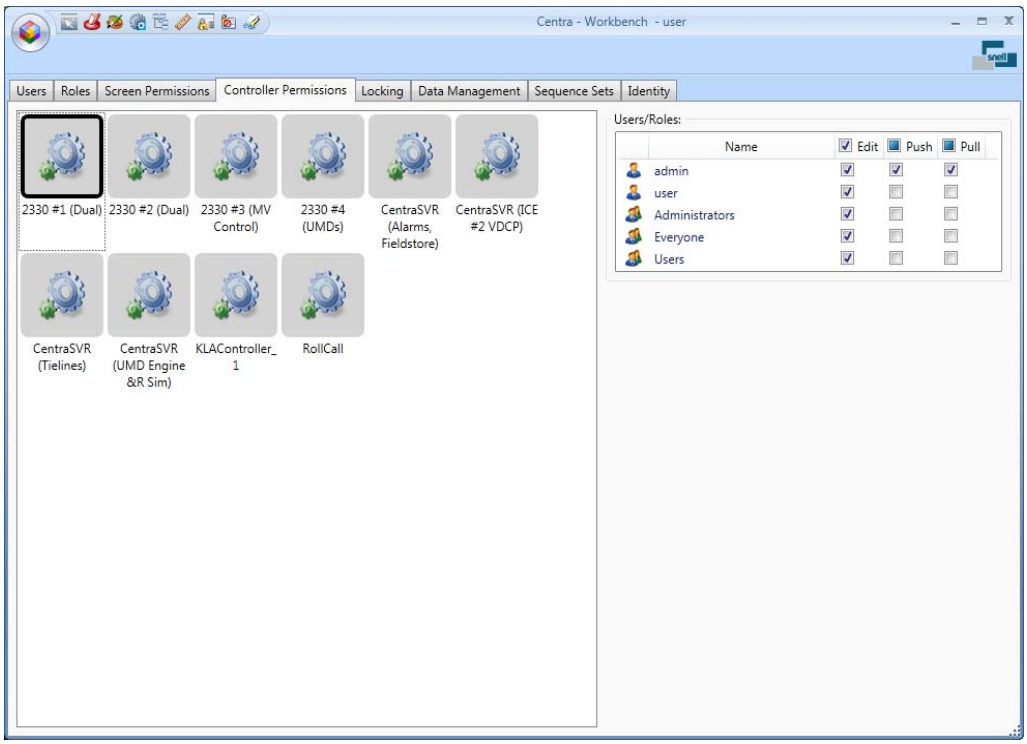

Fig 39. Controller Permissions

Permission has three levels:

- **Read**: The basic level of access, allowing read only permission. It is required for visibility in Run mode.
- **Push**: Allows the user to push a configuration to the controller.
- **Pull**: Allows the user to pull the configuration from the controller.

To allocate a permission, check the appropriate box.

4.6 Locking

Any screen or controller that is being edited is locked automatically. The Locking tab shows a list of users that currently have screens or controllers locked for editing (including users that have logged out of Workbench without saving a screen that was being edited). If a screen or controller has been inadvertently locked, select the item and click the **Unlock Selected** button.

Click **Refresh list** to update the list of users that have locked screens or controllers. Since this list is not automatically updated, it should be done before doing anything else.

Note: Unlocking a screen or controller does not give a warning to the user that has the lock. Ensure that the screen or controller is not currently being edited or any changes may be overridden.

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4.7 Data Management

The Data Management tab is used for backing up and restoring Workbench screens, and for repairing the database.

The tab also shows the path to the current database, and licensing details.

4.7.1 Screen Management

To backup screens:

1. Click **Backup Screens**.
2. Browse to the folder into which the backup files are to be saved and then click **OK**.

To restore screens:

1. Click **Restore Screens**.
2. A warning screen displays stating that all existing objects will be deleted. All changes that have been made since the backup file was created will be lost.
3. If this is acceptable, click **OK**. If not, click **No**.

Note: It is possible to export individual screens from the Design screen, Individual Controllers from Configuration or the entire database using SQL Management Studio. For information about performing database backup and restoration from SQL Management Studio, refer to the SQL Management Studio online help.

4.7.2 Database Repair

These functions are used to ‘clean’ the database and purge unused items.

Important: The following functions change the database, and cannot be undone. Ensure the database has been backed up before using these functions.

To remove unassigned widgets and behaviors with no association:

1. Click on the **Remove Orphaned Objects** button.
2. A warning screen displays.
3. If this is acceptable, click **OK**. If not, click **No**.
4. When complete, a summary screen displays indicating the number of changes made.

To fix widgets that have an invalid behavior, for example, add a passive behavior to widgets with a null behavior:

1. Click on the **Fix Widget Behaviors** button.

   A window displays showing the screens that contain null behavior widgets.
2. Select the screens to be fixed, and click **OK**.
3. When complete, a summary screen displays indicating the number of changes made.

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4.8 Sequence Sets

Sequence Sets are required for soft panel configuration. Sequence Sets group the key entry sequences that are required to enter sources and destinations via keypads.

To add a sequence set:

- Click on the **Add** button.

Key sequences are defined either on the fly using a dial-up keypad on a soft panel, or in the Key Sequences Editor in Design mode. See “Key Sequences” on page 121.

To remove a sequence set:

- Select a sequence set from the list, and click the **Remove** button.

4.9 Identity

The Identity tab lists the Machines, External Clients and Internal Clients that are present on the network, and are linked to Workbench. It identifies which soft panel client has protected a route.

Machines	PCs running Workbench router configuration software
External Clients	PCs running Workbench soft panels
Internal Clients	Hardware control panels connected directly to the router controller

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5. Configuration

5.1 Description

Configure controllers, devices and panels for use with Workbench. Configurations are stored as databases. Sample databases are available to quickly get started with Workbench.

To open configuration mode, log in as a user with Configuration permissions, see section 4.3.

5.2 Screen Layout

Configured controllers display in the main part of the window. To the right is a menu for configuring, saving, resetting, etc. the controllers. These features are covered later in this section. A pop-up menu is also available with a right-click when a controller is selected.

5.2.1 Sample Controllers

If a sample database is installed (see Appendix F.), the configuration screen lists several controllers, see Fig 40.

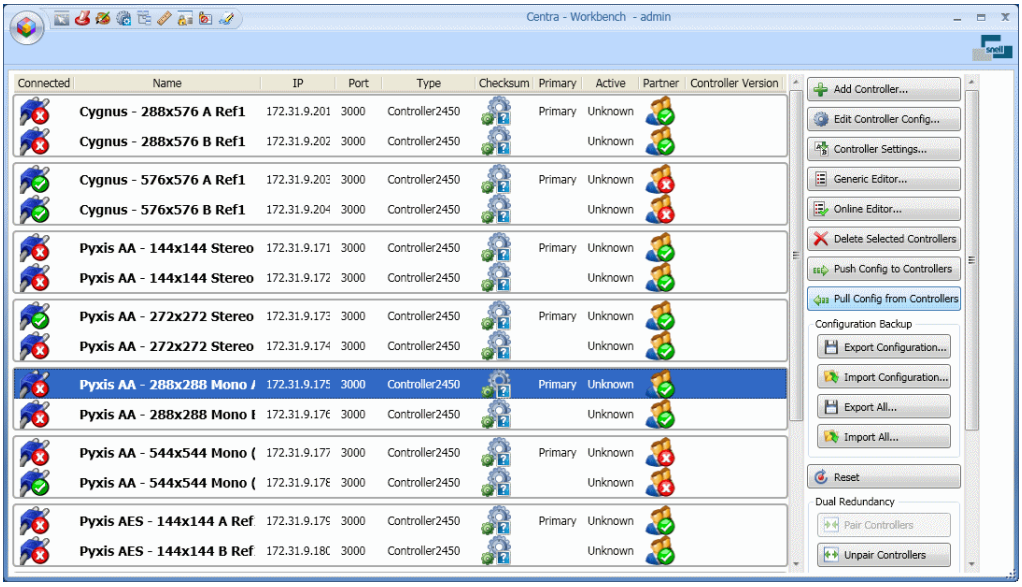

Fig 40. Default Nucleus Controllers

5.2.2 Networks

The database supplied on the Workbench install CD lists numerous router controllers. Each controller has a default IP address.

Each router has the router controller software running on the controller card. The controller has a default **fixed** IP address. If the router is connected directly, or through a local network, Workbench automatically identifies the controller, and shows it as connected correctly.

Note: If the fixed IP addresses of the physical controller causes a conflict on the network, change both the IP address of the physical router controller and the IP address of the controller listed in Workbench.

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5.2.3 Controller Status

The configuration screen shows the status of each controller. Icons show whether the controller is connected, and whether the databases in the physical controller and SQL server match. When using dual controllers, it shows which is the Primary controller and which one of the two controllers is currently active.

5.2.3.1 Connection Status

Icon	Description
	Controller: Disconnected. Workbench is trying to establish a connection.
	Controller: Connection Closed. No controller is found at the given IP address, and no connection is made. Change the IP address, see section 5.9.1.
	Controller: Connected but not ready.
	Controller: Connected. A controller is present and is connected correctly.
	Controller: Negotiating. Workbench is performing preliminary communication with the controller.
	Controller: Initializing. Workbench is waiting for the controller to initialize.
	Controller: Negotiation Failed. A controller is present at the given IP address, but the controller is not valid. Change the configuration settings, see section 5.9.1.

Table 8. Controller Connection Status

Note: If there is an IP address conflict, change the IP address of the physical Nucleus controller and change the Workbench controller settings, see section 5.9.1.

5.2.3.2 Checksum Status

The checksum icons show whether the database in the physical controller matches the database on the SQL server. Table 9. lists the Checksum status icons.

Icon	Description
	Configuration: Match. Both databases are identical.
	Configuration: Unknown. Unable to calculate configuration checksum on the controller. **Note**: RollCall does not calculate a checksum.
	Configuration: Mismatch. Configuration on the controller is different to the configuration in the database.

Table 9. Checksum Status

5.2.3.3 Primary Status

When using dual controllers the Primary column indicates which of the two controllers is the Primary Controller. The Secondary controller of a pair is left blank in this column.

Important: Swapping controllers loses the behavior for any hardware or software panels that references the Primary controller. Reconfigure the panels to reference the new Primary controller.

Single controllers do not require a Primary status and are left blank.

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5.2.3.4 Active Status

The Active column shows whether the status of the controller is Active, Unknown, or in Standby.

When updating the configuration of controller pairs, push the new configuration to the controller with Standby status (initially this is the Secondary controller), test the changes and, either revert to a previous state, or update to the Active controller (initially this is the Primary controller).

Note: Information does not pass between controllers. To make both controllers match, click the **Copy config to partner** button and then push the configuration to the controllers.

5.2.3.5 Partner Config Matches

For dual controllers, the Partner Config Matches icons indicate whether the databases match for the Primary and Secondary controllers, see section 5.9.5.

Icon	Description
	Both databases match.
	There are differences between the databases.

Table 10. Partner Status

5.2.3.6 Controller Version

This column shows the controller version and the date that it was last changed. This is useful for determining which database to update if there is a mismatch between dual controllers, see section 5.2.3.5.

Note: Workbench and the controller version must be compatible.

5.3 Menu

The following menu items are available at the right side of the screen:

Add Controller...	Add a new controller. See “Add a New Controller” on page 48.
Edit Controller Config...	Edit the configuration of the selected controller. See “Edit Controller Configuration” on page 51.
Edit IP Address or Name...	Edit the IP address and name of the selected controller. See “Edit Controller IP Address or Name” on page 96.
Generic Editor...	Open the Generic Editor. See “Generic Editor” on page 94.
Online Editor...	Open the Online Editor. See “Online Editor” on page 95.
Delete Selected Controllers	Delete the selected controller, or several controllers if a group selection has been made.
Push Config to Controller(s)	Push the current configuration to all selected controllers. See “Push and Pull Configuration” on page 97.
Pull Config from Controller(s)	Pull the configuration from a controller. See “Push and Pull Configuration” on page 97.
Export Configuration...	Export the configuration of the current controller to a .zip file.
Import Configuration...	Import a configuration file (.zip) to the selected controller.
Export All...	Export the configuration of all controllers to a .zip file. **Note:** The exported file contains controller configuration, and is not a complete database backup.

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Import All...	Import a configuration file (.zip) to all controllers.
Reset	Resets the selected controller. See “Reset” on page 98.
Pair Controllers	Pair two similar controllers to give a dual redundancy. See “Dual Redundancy” on page 98.
Unpair Controllers	Unpair two paired controllers.
Swap Pair	Set the Primary controller to be the Secondary controller, and the Secondary controller to be the Primary controller. See “Swap Controllers” on page 99.
Copy config to partner	Copy the configuration of one controller to the other in the pair, ensuring the configuration matches. See “Copy Config to Partner” on page 99.
Refresh	Refreshes the list of controllers, and enables/disables menu functions, as applicable.
Connections	List the active controller connections. See “Connections” on page 100.
Oid Rewriter...	Change OID references. See “OID Rewrite Helper” on page 100.
Snapshot Editor...	Save the current crosspoint configuration to a snapshot file, or import a saved snapshot configuration file. See “Snapshot Editor” on page 101.
Delete RollCall Cache	Clears the cache of RollCall menu set data. See “Delete RollCall Cache” on page 104.

With a controller selected, a right-click displays some of the above menu items in a pop-up menu, plus the following additional menu items:

Find Usages...	Opens a new window listing the screen and rules that reference the selected controller.
Convert to 246x	When replacing an existing Nucleus 2450 controller with a new Nucleus 246x controller, convert the 2450 configuration to that of a 246x without having to reconfigure the new controller. See “Convert a Nucleus 2450 Controller to a 246x Controller” on page 104.
Create Default Screen	Opens the New Screen Wizard for panels. See “Screens” on page 108.

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5.4 Configuring Controllers

A controller is a hardware platform that hosts one or more driver interfaces. A driver is a software implementation of an interface over serial, IP, or GPI that communicates with a PC, router, or modular frame.

Note: Set up a controller to match the system requirements. That is, the configuration of the routers, panels, third-party interfaces, and so on, in the system.

5.4.1 Add a New Controller

1. Click **Add Controller** and the Controller Wizard displays.

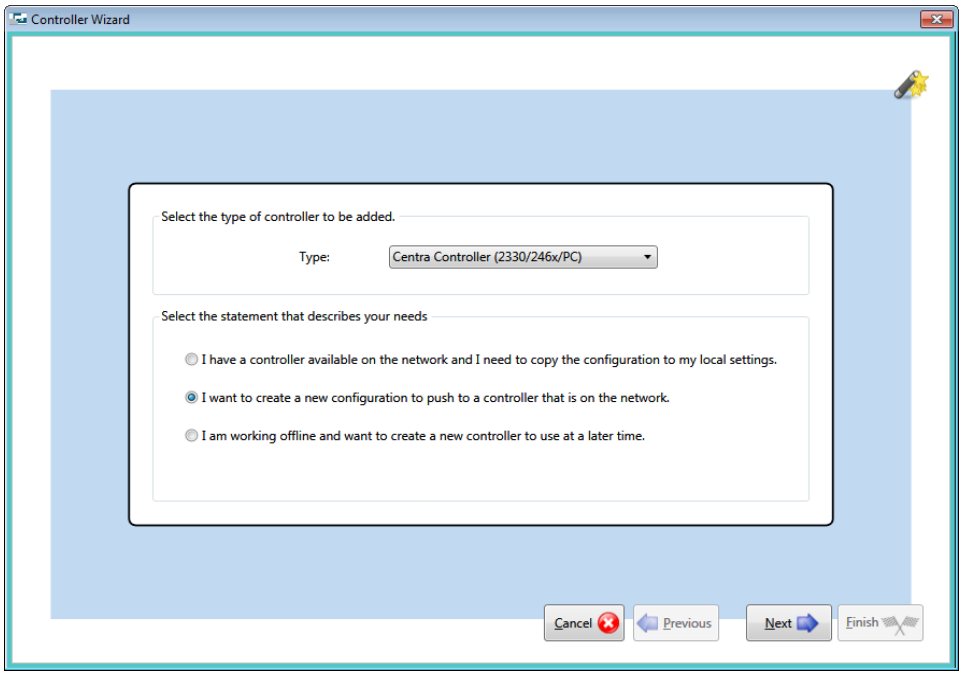
Controller Wizard
Select the type of controller to be added.
Type:
Centra Controller (2330/246x/PC)
Select the statement that describes your needs
I have a controller available on the network and I need to copy the configuration to my local settings.
I want to create a new configuration to push to a controller that is on the network.
I am working offline and want to create a new controller to use at a later time.
Cancel
Previous
Next
Finish

Fig 41. Select Controller Type

2. From the drop-down list, click on the relevant controller type:
   - Nucleus Controller (2450): Configured as a Router controller, and Panels device. A Nucleus 2450 Controller is installed inside a physical router (usually as a pair).
   - RollCall Gateway.
   - Centra Controller (2330/246x/PC): Generic controller that can be configured for a Router, or any combination of the devices available.
3. Click on the appropriate radio button according to the configuration required.
   - **I have a controller available on the network and I need to copy the configuration to my local settings** - to add a controller and use the existing configuration from a router.
   - **I want to create a new configuration to push to a controller that is on the network** - to add a controller for a new router.
   - **I am working offline and want to create a new controller to use at a later time** - to configure a controller for future use.

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5.4.1.1 To Configure a New Router on the Network:

1. If not already selected, select the second radio button **I want to create a new configuration to push to a controller that is on the network**.
2. Click **Next**.

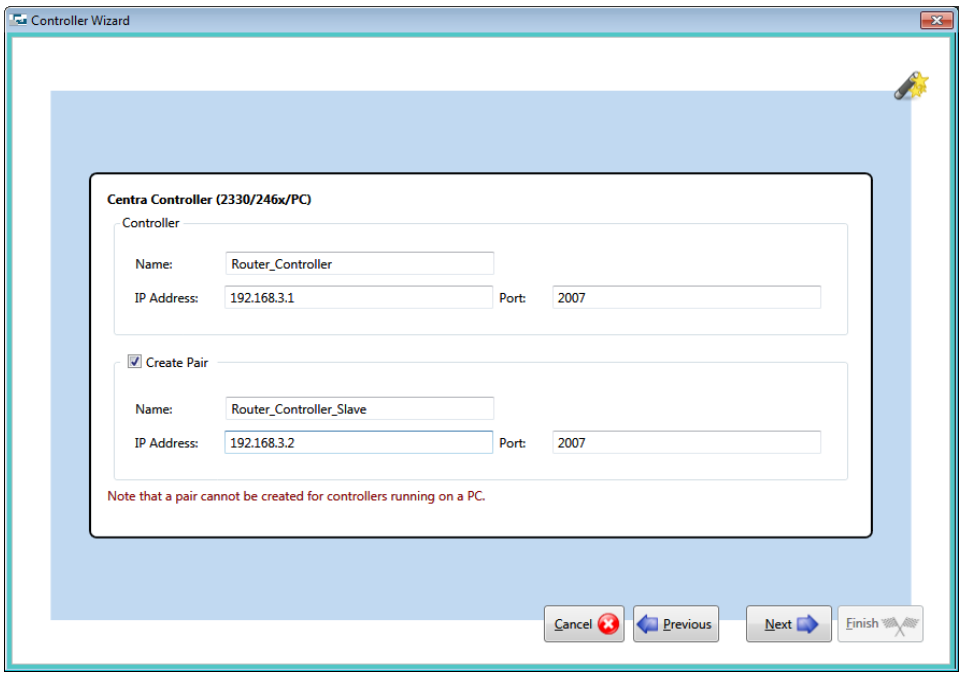

Fig 42. Set Controller Name

3. Type a name for the controller.
4. Edit the IP Address to match that set in the controller.

Note: If the controller is running on the local PC, use the localhost loop-back IP address of 127.0.0.1. The system does not accept 'localhost' as an IP address. If the IP address is set to 127.0.0.1, other computers cannot access the controller. To enable other computers to access the controller, use the PC's actual IP address.

5. Edit the Port number (Centra Controller only). Nucleus Controllers and RollMap Gateways have the ports automatically set to 3000 and 2050 respectively.

Note: If the IP address and Port number are unknown:

- For the Nucleus Controller, extract the CompactFlash from the controller and place it into a card reader to view the IP address from the Network.ini file. Refit the CompactFlash back into the controller.
- For the Centra Controller view the config.xml file that is on the USB memory stick for the controller.

6. If configuring a pair of controllers, check the Create Pair checkbox, and enter the details for the second controller.
7. Click **Next**.

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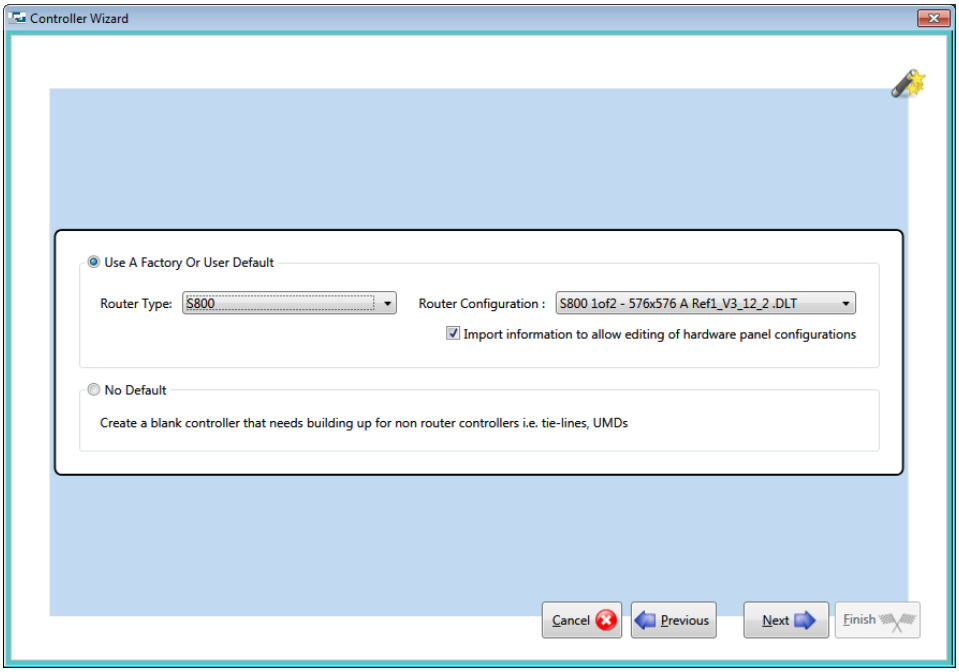

Fig 43. Set Router Type

8. Click the radio button Use a Factory Or User Default.

Note: No Default is used when installing a new system similar to a previously installed one. The existing configuration is then copied as a basis for the configuration of the new controller.

9. From the Router Type drop-down list, click the relevant router type.
10. From the Router Configuration drop-down list, click on the relevant row for the router which has the closest specification to the router being configured.
11. Click **Next**.
12. A summary screen displays. If any of the parameters on this screen are incorrect, click Previous to return to the screen that requires amendment. Edit the details, and continue through the Controller Wizard as before.

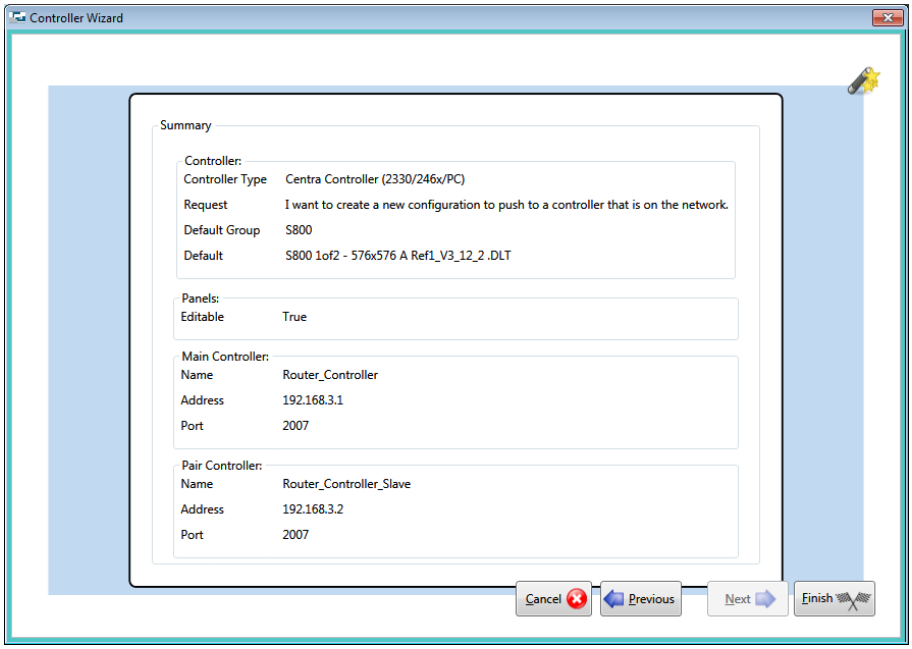

Fig 44. Check Controller Details

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13. Confirm that details for the controller configuration are correct.
14. Click **Finish**.
15. The controller is configured.

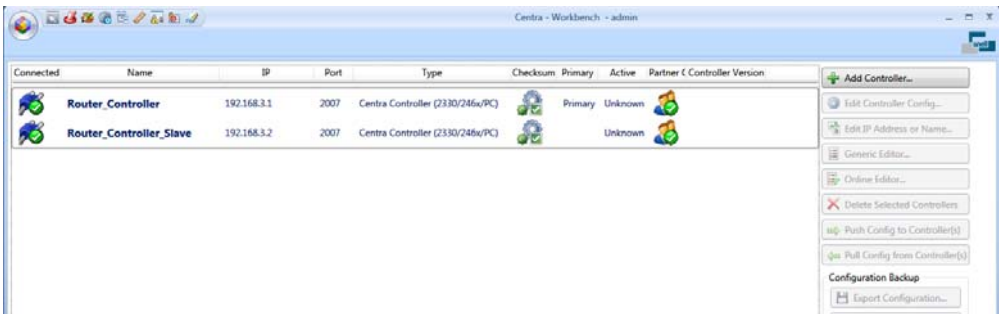

Fig 45. Controller Added

16. The Controller Status and Checksum icons show that the controller required further configuration, see section 5.9.1.

Note: Create a simulator controller, which is convenient for design purposes, before pushing the configuration to a hardware controller, see section 5.9.2.

5.4.2 Edit Controller Configuration

To edit the controller configuration, either double-click on a controller, or click the **Edit Controller Config…** button. The **Controller Configuration** window displays, see Fig 46.

Note: For RollCall Gateway controllers, double-clicking on the controller, or clicking the **Edit Controller Config…** button displays the **Generic Configuration Editor**.

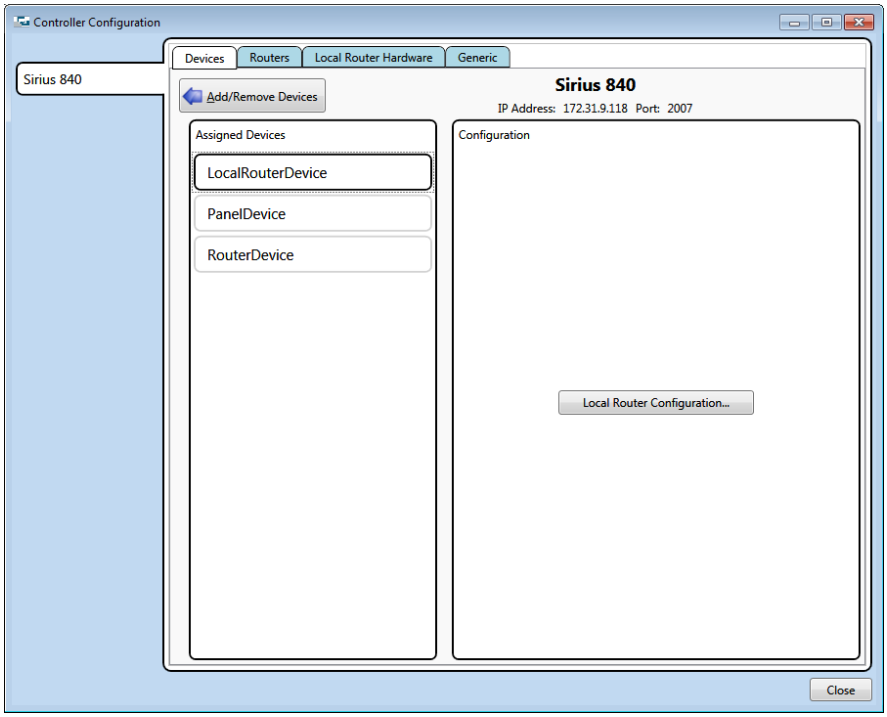

Fig 46. Controller Configuration

The Controller Configuration screen displays with the Devices tab open.

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The Tabs at the top of this screen are:

- **Devices** - Most controllers have default devices already selected. If there are no devices selected they must be added before configuration can begin.

  See “Configuring Additional Devices” on page 85.

- **Routers** - Basic configuration of the router.

  See “Configuring a Router” on page 52.

- **Hardware Config** - Additional configuration required when using a Nucleus 2450 controller in a router.

  See “Hardware Config” on page 68.

- **Local Router Hardware** - Additional configuration required when using a 246x controller in a router.

  See “Local Router Hardware” on page 72.

- **Generic** - Controller Configuration Editors (advanced configuration). Used to edit a controller using a logical tree structure format.

  See “Controller Configuration Editors” on page 93.

5.5 Configuring a Router

To access the Configuration screen, log in as a user with Configuration permissions, see section 4.3.

To configure a router:

1. Select the controller and either double-click, or click the **Edit Controller Config...** button.

   The Controller Configuration screen displays.

2. Click on the **Routers** tab.

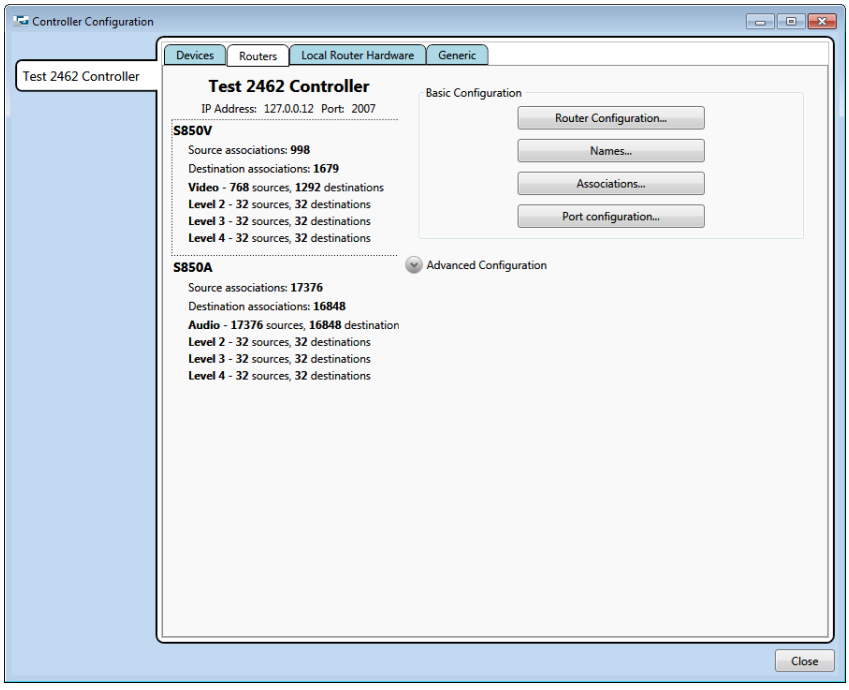

Fig 47. Router Configuration

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The controller has a default **fixed** IP address. If the router is connected directly, or through a local network, Workbench automatically identifies the controller, and shows it as connected correctly.

Note: If the fixed IP addresses of a physical controller causes a conflict on the network, change both the IP address of the router controller and the IP address of the controller listed in Workbench.

5.5.1 Router Configuration

- Click **Router Configuration...**

  The Router Database Configuration window displays.

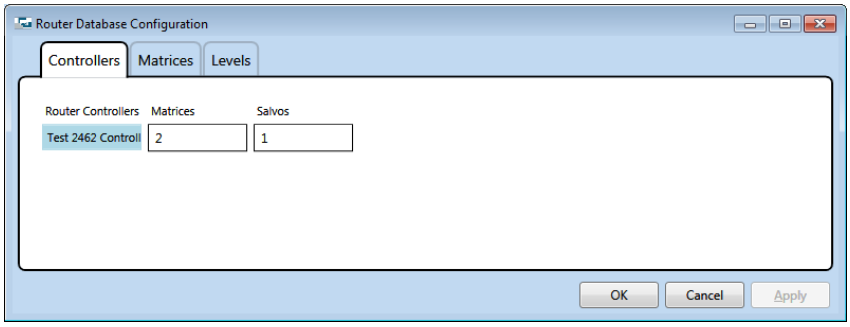

Fig 48. Router Database Configuration Window

Tab	Description
Controllers	Set the number of Matrices and Salvos.
Matrices	The number of Matrices is set on the Controllers tab. For each Matrix, set the name and number of levels.
Levels	The number of levels for each Matrix is set on the Matrices tab. For each Matrix and Level, set the name and number of Sources and Destinations. To automatically calculate the number of Source and Destination Associations, click the **Auto Calculate** button. The number of associations can also be configured manually. **Note:** For a single level system the number of associations should match the level size.

Table 11. Router Database Configuration Tabs

5.5.2 Names

The Names Editor is used to add/edit the names of the Sources, Destinations and Salvos. The names can be 4, 8, 12, 16, or 32 characters long. Names within each character length tab should be unique. All name types can be used with Workbench soft panels.

The character length used is set by the device connected to the controller. For example:

4-character names	for 6236, 6237 panels and Tx product
8-character names	for 6276, 6277 panels and Under Monitor Displays
12-character names	for 677x panels
16-character names	for UMD devices
32-character names	for RollCall hardware panels
Tag names	See “Tag Names” on page 55.

Note: Only enter names in the character lengths that will be used to avoid needlessly filling the database. Names entered that are too long for the currently selected character length are automatically truncated.

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- Click **Names...**

  The Names Editor window displays.

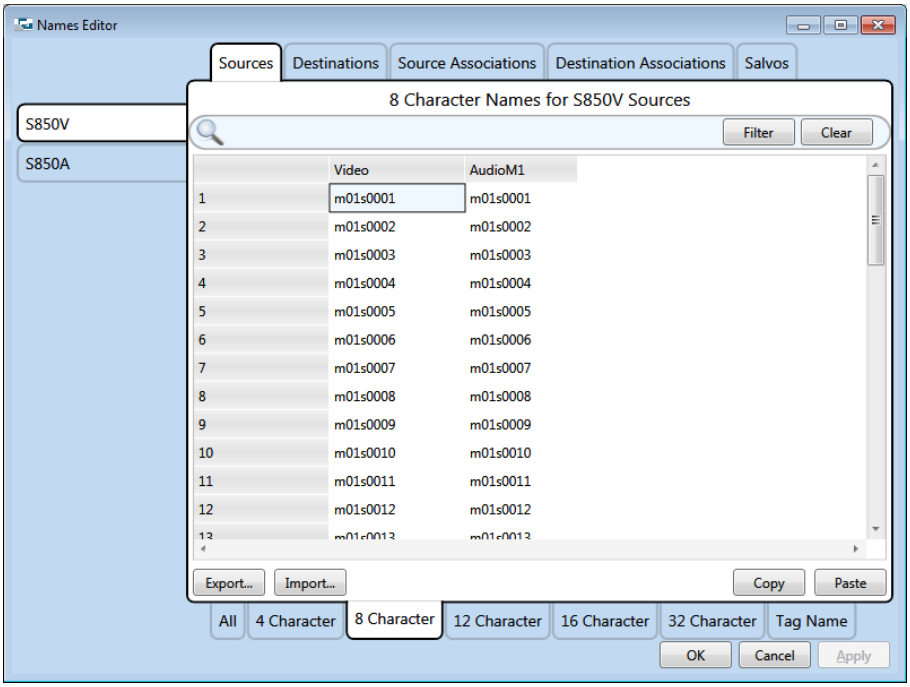

Fig 49. Names Editor

The Names Editor has different main tabs for naming the following:

- Sources
- Destinations
- Source Associations
- Destination Associations
- Salvos

A filter is available in a number of the tabs to quickly find sources and destinations.

- Enter alphanumeric characters into the search bar (for example, “VTR”, or “Edit 1”) and click on the **Filter** button. The display changes to show only the items containing the filter text in the source or destination name.
- Click on the **Clear** button to remove a filter.

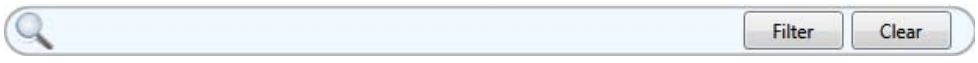

Fig 50. Filter

The tabs at the bottom display All, 4-character, 8-character, 12-character, 16-character, 32-character, or Tag names. Changing a Source or Destination name in one character format does not change the corresponding source or destination in all other character formats.

The names default to the names from the 16-character format.

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Import and Export Names

Names can be imported in from, or exported to, a .csv file, using the Import and Export buttons. This allows names to be easily edited offline, and brought back in as a whole.

Tip: Export a default spreadsheet to give a basic structure into which to add new names.

Note: Configurations may be also copied to and from Excel database configuration forms (the names must match). To select a range of cells from the Source Associations and Destination Associations tables, select the first cell in the range, hold down the Shift Key and then click on the last cell in the range.

5.5.2.1 Tag Names

Tag Names enable names to be changed while the system is in run mode.

- Pull the configuration from the controller to view any changes to the tag names.
- Push the configuration to the controller to update the tag names on it.

Tag names use the 16-character format if selected on screens.

5.5.3 Associations

- Click **Associations...**

  The Associations Editor window displays.

Associations are used with control panels as a means of switching more than one level of routing on a single button press. For example, VTR signal levels can be grouped into a single association:

- Level 1 = video
- Level 2 = audio

Source Associations refer to the group of sources, and Destination Associations refer to a group of signals at a destination. The Association, Source and Destination names can be changed through the Names Editor, see section 5.5.5.4.

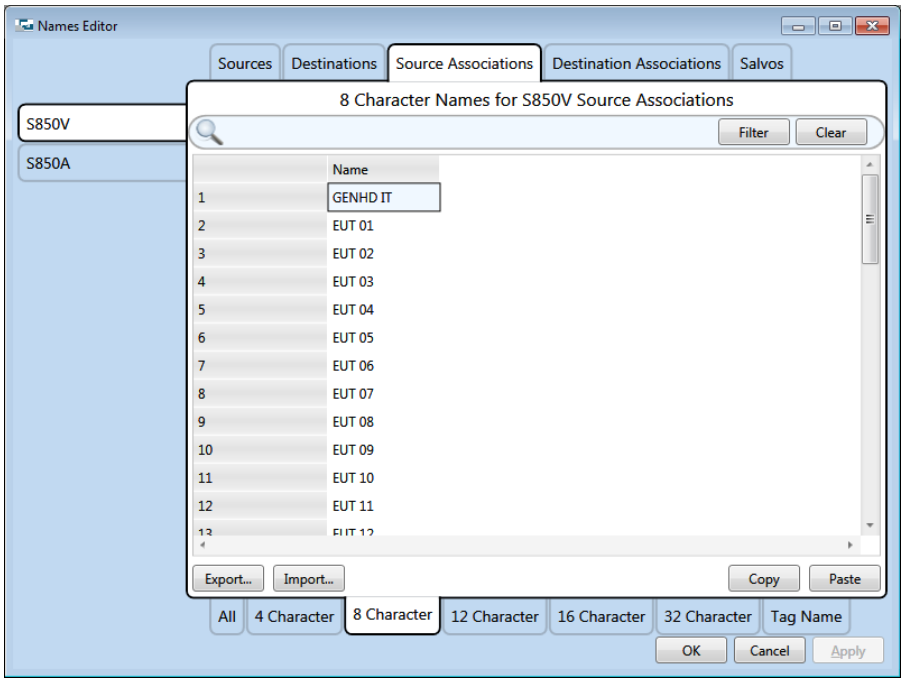

Fig 51. Associations Editor

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For each matrix (tabs on the left), select the Source/Destinations from the drop-down list.

The tabs at the bottom are used to switch between All, 4-character, 8-character, 12-character, 16-character, 32-character, or numeric names. Selecting a different Source or Destination in one character format selects the corresponding source or destination in all other character formats.

Note: Configurations may be copied to and from Excel database configuration forms (the names must match). To select a range of cells from the Source Associations and Destination Associations tables, select the first cell in the range, hold down the Shift Key and then click on the last cell in the range.

A filter is available in a number of the tabs to quickly find sources and destinations.

- Enter alphanumeric characters into the search bar (for example, “VTR”, or “Edit 1”) and click on the **Filter** button. The display changes to show only the items containing the filter text in the source or destination name.
- Click on the **Clear** button to remove a filter.

Fig 52. Filter

5.5.4 Port Configuration

The Port Configuration window specifies which COM port on the host machine is used to communicate with the controller, and the protocol used.

Note: The internal COM port usage described is not applicable when using a PC controller.

- Click **Port configuration...**

The available COM ports display on the left of the window, see Fig 53.

5.5.4.1 Serial/IP Port Configuration

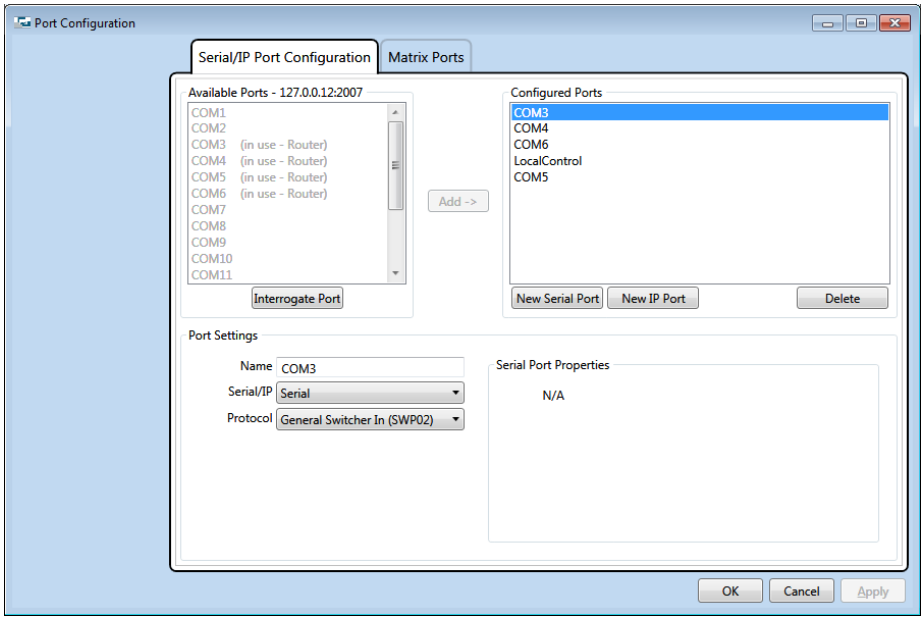

Fig 53. Serial/IP Port Configuration

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Note: COM1 and COM2 are internal COM ports.
For S800 Series routers Port 1 must be set to Local Controller.
Port 1 is an internal port for setting a simulator on a PC with no COM ports.
For Nucleus controllers, the local port is required for internal crosspoint settings.

COM3 is the first external serial port and connects to Port 1 on the router rear panel, see Table 12.

COM 5 is used for hardware control panels in the sample router databases. Hardware panels can be connected to any port, and COM 5 may be used in the same way as other ports.

The Local Control port, and IP ports may be renamed.

Note: Serial ports cannot be renamed.

Workbench	Rear Panels	
	Sirius / Cygnus	Pyxis
COM 3	Port 1	Port 1
COM 4	Port 2	Port 2
COM 5	Port 3	Port 3
COM 6	Port 4	None

Table 12. Com Ports Example

- To update the list of available ports, click **Interrogate Port**.

Note: The list of ports is not automatically updated: To ensure that the list is up-to-date, manually interrogate the ports.

If the controller is not connected, the interrogation does not work.

To add a port:

1. Select a COM port from the list of available ports and click **Add**. The port displays in the Configured Ports column.
2. Highlight the port in the Configured Ports column.
3. Define the port properties according to whether it is serial or IP. For Serial port configuration see Table 13. For IP port configuration, see Table 14.
4. Click **Apply** to save changes.

Note: Workbench does not automatically verify that COM ports are not in use.

The following table shows the default electrical setup of the serial/IP-based communication protocols for Workbench:

Protocol	Baud Rate	Data Bits	Parity	Stop Bits	RS422 Port Mode
General Switcher In	38400	8	EVEN	1	Device
General Switcher Out	38400	8	EVEN	1	Controller
General Remote In	38400	8	NONE	1	Device
General Remote Out	38400	8	NONE	1	Controller
Kramer Out	9600	8	NONE	1	Controller/RS232 DTE

Table 13. Default Comms Protocols

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Protocol	Baud Rate	Data Bits	Parity	Stop Bits	RS422 Port Mode
Simulated Out	No electrical setup parameters				
Local Control					
ETL Matrix	19200	8	NONE	1	Controller
Leitch Harris Pass Through In	9600	8	NONE	1	Device
GVGES Control In	38400	8	ODD	1	Device
GVGES Control Out	38400	8	ODD	1	Controller
Barco Rosa In [1]	19200	8	NONE	1	Controller

Table 13. Default Comms Protocols

[1] An RS422 crossover cable is required for this connection.

IP Port Properties	Description
Controller Type	Select the router controller type from the drop-down list
Single/Dual	Select whether the controller is a Single or Dual device
IP Address (primary)	The IP address of the device
IP Port (primary)	The port number of the device
IP Address (secondary)	The IP address of the secondary device (Dual mode only)
IP Port (secondary)	The port number of the secondary device (Dual mode only)

Table 14. IP Port Configuration

The General Switcher In protocol, over IP, for the Nucleus 2450 controller is configured in the separate initialization file. See “Configuration Initialization File” on page 197.

5.5.4.2 Matrix Ports

The **Matrix Ports** tab makes it possible to map the logical arrangement of signals defined in the Matrix and Levels to the physical inputs and outputs of the routers.

- To add a Matrix Port, select the Matrix and Level, and click **Add Port**.

  An entry displays in the Matrix Ports list, see Fig 54.

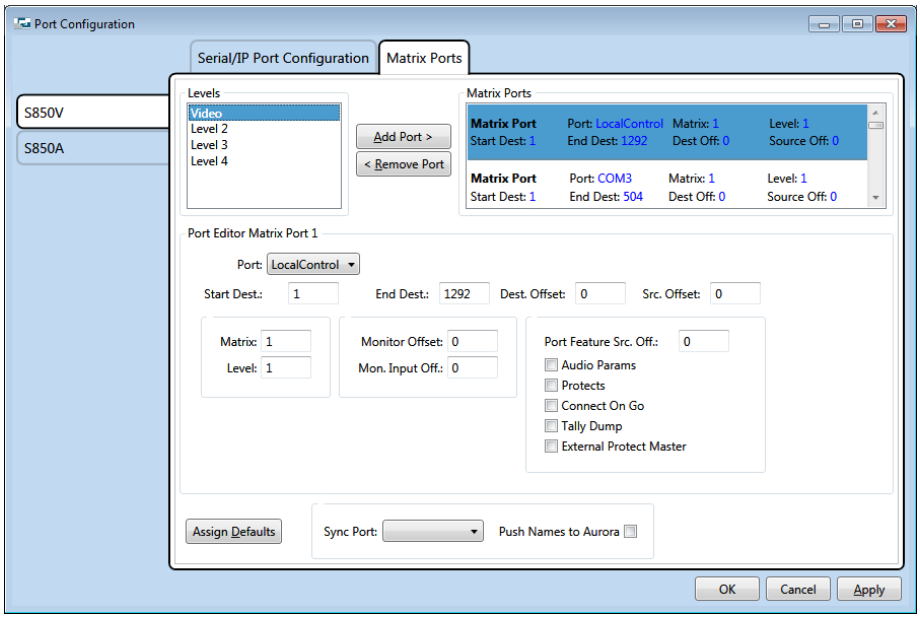

Fig 54. Matrix Ports

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- Highlight the matrix port to edit, and define the port properties according to the following:

	Description
Port	Select a COM port number that communicates with the router from the drop-down list.
Start Destination	The logical start position the port numbers within a level.
End Destination	The logical end position the port numbers within a level.
Destination Offset	The destination offset applied to the level so that it maps to the physical router.
Source Offset	The source offset applied to the level so that it maps to the physical router.
Matrix	Maps the matrix number in the controller to the matrix number in the controlled router device.
Level	Maps the level number in the controller to the level number in the controlled router device.
Monitor Offset	The destination offset to the monitor row in the controlled router. The monitor rows allow the user to view an output or input on a one or more special monitoring outputs. Some routers have none, some have one and some have more than one. For example, Sirius800/Cygnus have four, Sirius 600 has one, Pyxis has none.
Monitor Input Offset	This is the offset to the source in the protocol for the first monitored input. In the protocol, outputs come first followed by inputs. The inputs normally start at a fixed offset but for different router controllers this offset is different. For example, for Cygnus the offset is 576.
Port Features Source Offset	Used in conjunction with the Audio modify commands where all the levels are stacked on top of each (defines the start of that levels first source). This is used in the General Switcher Protocol which has no concept of matrix and level, just sources and destinations, so matrix/levels are addressed using ranges of source and destination numbers. This is not limited to General Switcher Protocol, it applies to any protocol that needs it.
Audio Params	This checkbox, when selected, allows audio modify commands (L-R, L-L, R-R, R-L, MONO).
Protects	This checkbox, when selected, enables protects on a slaved router.
Connect On Go	This checkbox, when selected, allows accumulated crosspoint commands to be actioned in one go.
Tally Dump	Allows a controller to get a complete dump of crosspoint tallies from a router to speed up router interrogation.
Assign Defaults	Configures the ports to a default setting according to the number of levels and the matrix sizes.
Sync Port	Select the port from the drop-down list to auto-sync names.
Push Names to Aurora	This checkbox option automatically synchronizes the names used by the controller with the names. This option only works if the port is configured for GeneralRemoteOut.

Table 15. Port Editor Matrix

Example 1 - One Matrix With Two Levels Mapped To One Router

For a single local[1] or external[2] matrix with two levels, each of which has a start destination of 1 and an end destination of 16, map these signals a single router so that there is an offset of 16. That is, the router has 32 destinations, see Fig 55.

1. Local: Cards in the same frame
2. External: Serial controlled external level

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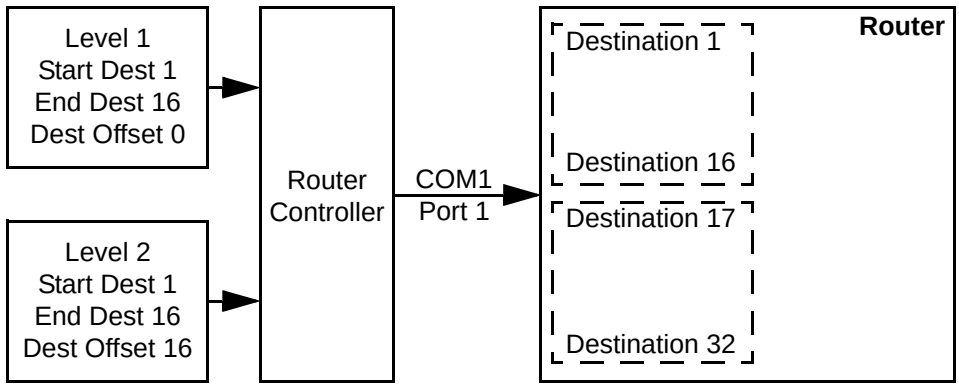

Fig 55. Matrix Ports - Example 1

To create the Matrix Ports for this example:

1. Select Matrix 1.
2. Select Level 1, and add a Matrix Port. Select the port in the Matrix Ports list.
3. Set the **Start Dest** to 1, and set the **End Dest** to 16.
4. From the Port drop-down list, select COM1. Click **Apply**.
5. Select Level 2, and add a Matrix Port. Select the port in the Matrix Ports list.
6. Set the **Start Dest** to 1, set the **End Dest** to 16, and set the **Dest Offset** to 16.
7. From the Port drop-down list, select COM1. Click **Apply**.

Example 2 - One Matrix With One level Mapped To Two Routers

For a single matrix with one level that must map to two routers, split the destinations so that destinations 1 to 16 go to Router X, and destinations 17 to 32 go to Router Y, see Fig 56.

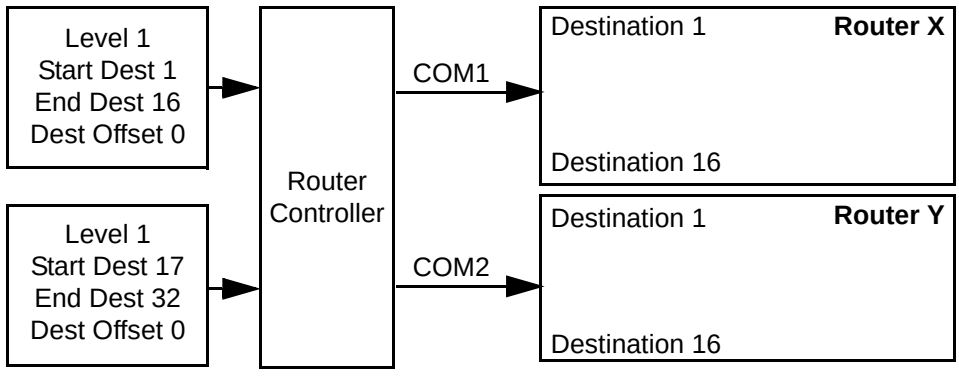

Fig 56. Matrix Ports - Example 2

To create the Matrix Ports for this example:

1. Select Matrix 1.
2. Select Level 1, and add a Matrix Port. Select the port in the Matrix Ports list.
3. Set the **Start Dest** to 1, and set the **End Dest** to 16.
4. From the Port drop-down list, select COM1. Click **Apply**.
5. Add a second Matrix Port. Select the port in the Matrix Ports list.
6. Set the **Start Dest** to 17, and set the **End Dest** to 32.
7. From the Port drop-down list, select COM2. Click **Apply**.

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Example 3 - Two Matrices Each With One Level Mapped to One Router

In this example video and audio are separated into two matrices each with one level. The starting destination of each level starts at one, b ut the matrix ports will be setup to run consecutively and also remove any unused audio destinations. See Fig 57.

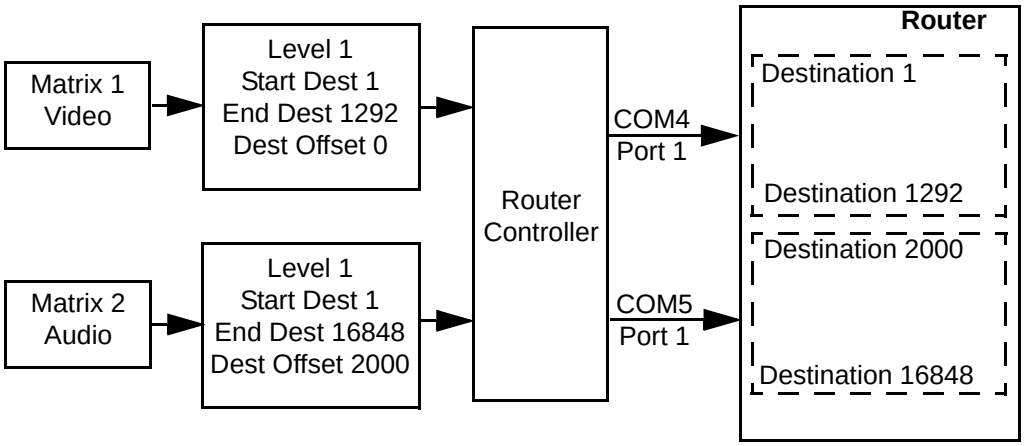

Fig 57. Matrix Ports - Example 3

To create the Matrix Ports for this example:

1. Select Matrix 1.
2. Select Level 1 (Video), and add a Matrix Port. Select the port in the Matrix Ports list.
3. Set the Start Dest to 1, and set the End Dest to 1292.
4. From the Port drop-down list, select COM3. Click **Apply**.
5. Select Matrix 2.
6. Select Level 1 (Audio), and add a Matrix Port. Select the port in the Matrix Ports list.
7. Set the Start Dest to 1, and set the End Dest to 16848, and set the Dest Offset to 2000.
8. From the Port drop-down list, select COM4. Click **Apply**.
9. From the Port drop-down list, select COM1. Click **Apply**.

Example 4 - Source Offsets

A source offset can also be configured in the port record. This is used when two levels are configured on a single router as, see Fig 58. The second level requires an offset so that logical source 1 maps to physical source 16.

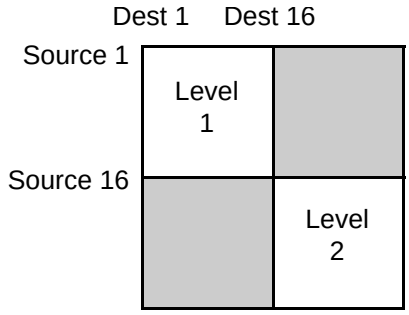

Fig 58. Source Offsets Example

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5.5.5 Advanced Configuration

To access the Advanced Configuration options, click on the Advanced Configuration button ( ).

5.5.5.1 Levels

A level is a logical grouping of inputs and outputs, which may or may not have a direct correspondence with a particular piece of hardware. Typically, a level depends on operational requirements, and represents groups of inputs and outputs such as video, or audio, or data.

- Click **Levels...**

  The Levels Configuration Editor window displays.

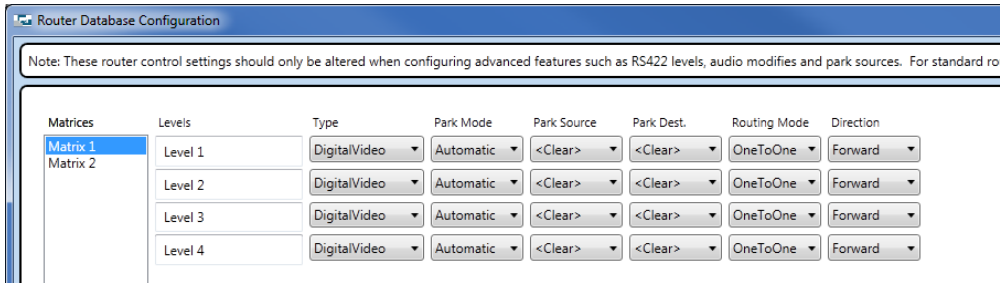

Fig 59. Levels Configuration Editor

- Edit the Levels parameters according the following:

Column	Description
Matrices	Shows the Matrix names. The number of Matrices is set in the Router Configuration Editor.
Levels	Shows the level name. The number of levels for each Matrix is set in the Router Configuration Editor.
Type	Select from the list of audio, video and data types.
Park Mode	Only valid if the type is set to RS422. When an RS422 router is in one to one routing mode, unused destinations must be 'parked' at the park source ('off' position). To free a source, there are two options: • Automatic - Workbench controls the parking. • Manual - The operator must set the parking.
Park Source	Only valid if the type is set to RS422. The park source reference for RS422 routing.
Park Dest.	Only valid if the type is set to RS422. The park destination reference for RS422 routing.
Routing Mode	Only valid if the type is set to RS422. Routing mode is either: • One to One - One source to one destination. • Broadcast - One source to multiple destinations.
Direction	This sets the direction of signal flow for the current router level. Direction is either: • Forward - Source to Destination. • Reverse - Destination to Source.

Table 16. Levels Configuration Settings

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5.5.5.2 Inhibits

Route Inhibits prevent signals from being routed from an input to a specific output. For example, to prevent a signal from being routed back to itself. This is common if the same large router is in use for playback of different channel content such as sport and children's channels.

Important: The inhibits cannot be changed from any hardware or soft panels.

- Click **Inhibits...**

  The Inhibits Editor window displays.

The Inhibit Editor makes it possible to set or remove route inhibits for each level of the currently selected matrix, see Fig 60.

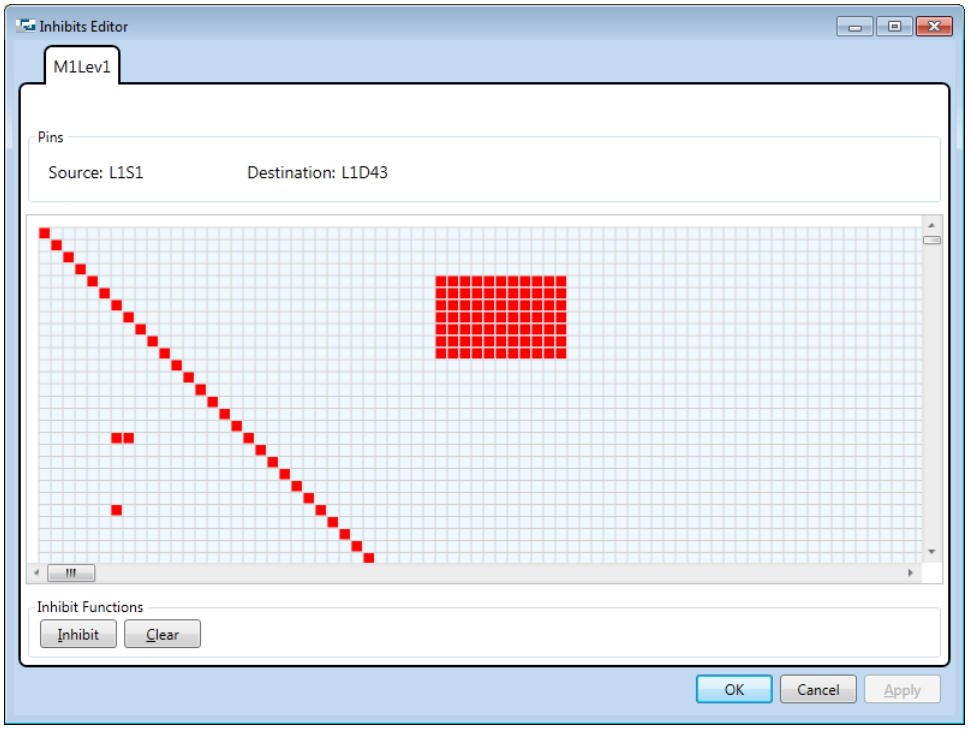

Fig 60. Inhibits Editor

- To set/clear an inhibit, select a point, or click and drag to select a group of points, and click the **Inhibit** or **Clear** button.
- Press the space bar to repeat the previous action, either inhibit or clear, on the next selected point or group of points.

Note: The maximum size of the Inhibits Editor is 2048 x 2048.

5.5.5.3 References

This section relates to video references for switch points. For Audio Reference configuration, see section A.11.

The Switch Point Editor specifies which reference type the signal can switch from, and whether the switch occurs on field or frame. Freeway routers have both 525 and 625 reference inputs. Sirius 600 and Cygnus routers have 525, 625 and HD reference inputs. A Nucleus controller (Sirius 800 range, Cygnus and Pyxis routers) automatically detects the incoming reference. Therefore, it can be configured to switch on a specific standard.

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Important: If there is no reference signal, or the reference is different to the signal being passed, the router switches on receiving the command, but does not provide a clean switch.

- Click **References...**

  The Switch Points Editor window displays.

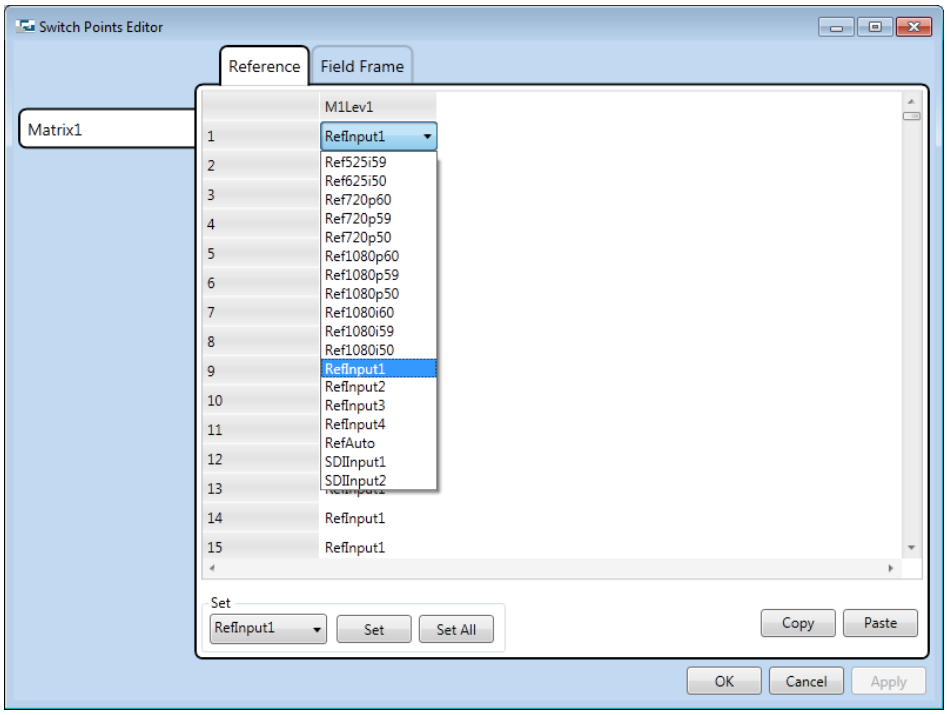

Fig 61. References Editor

The switching points can be set for individual sources and levels. Table 17. lists the switching point references:

Reference	Description
Ref525i59	525 interlaced 59 Hz
Ref625i50	625 interlaced 50 Hz
Ref720p60	720 progressive 60 Hz
Ref720p59	720 progressive 59 Hz
Ref720p50	720 progressive 50 Hz
Ref1080i60	1080 interlaced 60 Hz
Ref1080i59	1080 interlaced 59 Hz
Ref1080i50	1080 interlaced 50 Hz
Ref1080p60	1080 progressive 60 Hz
Ref1080p59	1080 progressive 59 Hz
Ref1080p50	1080 progressive 50 Hz
RefInput1 to RefInput4	Override the auto-detection by using a fixed reference input which allows for the same standard but offset for timing issues to be resolved. Alternatively, set a derived reference (246x only). See “Derived References” on page 81.
RefAuto [1]	Sets the reference type based on the signal type detected on the input.

Table 17. Switch Points

[1] When using RefAuto, detected 3G dual-link input signals are specified to use the equivalent 1080i references.

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- On the Field Frame tab, set the switching point to occur on field or frame.

Note: Field-based switch points can only be applied to interlaced formats.

To set a switching point:

1. On the **Reference** tab, select the required reference standards for the matrix. To do this, do one of the following:
   - Select the Reference standard for each cell individually.
   - Select a group of cells and in the **Set** drop-down list (in the lower left corner of the window) select a reference standard, then click **Set**.
   - Set one cell and then use the Copy and Paste functions to populate the remainder.
2. On the **Field Frame** tab, select **Field** or **Frame** as required. Click **Apply**, and **OK** to confirm.

There is an additional reference type that can be set for a source. This is called “RefAuto”, it automatically sets the reference type based on the signal type detected on the input. This allows any signal 625, 525, and so on to be connected to that input and the correct reference used for the switch without having to change the database. This is useful for SD/HD inputs from the same connection.

5.5.5.4 Audio Modifies

The settings in Audio Modifies specify the manipulation performed on audio streams when routed through the crosspoint. The settings specified here are the defaults and can be overridden from a hardware XY control panel during normal operation. Audio modifies can act on sources, destinations or both.

- Click **Audio Modifies...**

  The Audio Modifies Editor window displays.

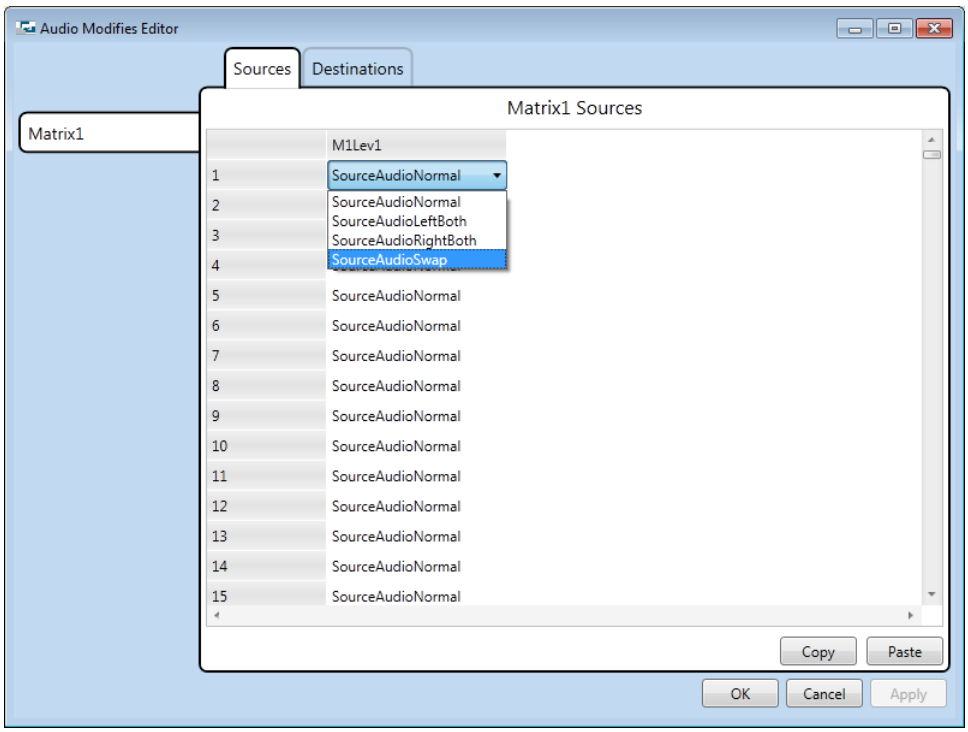

Fig 62. Audio Modifies Editor

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Table 18. lists the Source Audio Modifies.

Source	Description
SourceAudioNormal (Default)	No audio manipulation is performed on the source audio.
SourceAudioLeftBoth	The left channel of a stereo source pair is routed to both the left and right channels on the output.
SourceAudioRightBoth	The right channel of a stereo source pair is routed to both the left and right channels on the output.
SourceAudioSwap	The left and right channel of a stereo source pair are swapped before being routed to the output.

Table 18. Source Audio Modifies

Table 19. lists the Destination Audio Modifies:

Destination	Description
DestAudioNormal (Default)	No audio manipulation is performed on the destination audio.
DestAudioSwap	The left and right channel of a stereo source pair are swapped before being routed to the output.
DestAudioMono	A stereo source pair is routed to a mono destination.

Table 19. Destination Audio Modifies

After configuring source and destination audio modifies, click **Apply** to save the setup.

5.5.5.5 Salvos

A salvo is an operation that allows multiple, otherwise unrelated, routes to be selected with a single button press. They are stored in the controller and fired by a reference from a control panel.

Salvos are generated by adding crosspoints in the Salvo Editor, or by importing salvos previously saved as comma-separated text files.

- Click **Salvos**

  The Salvos Editor window displays.

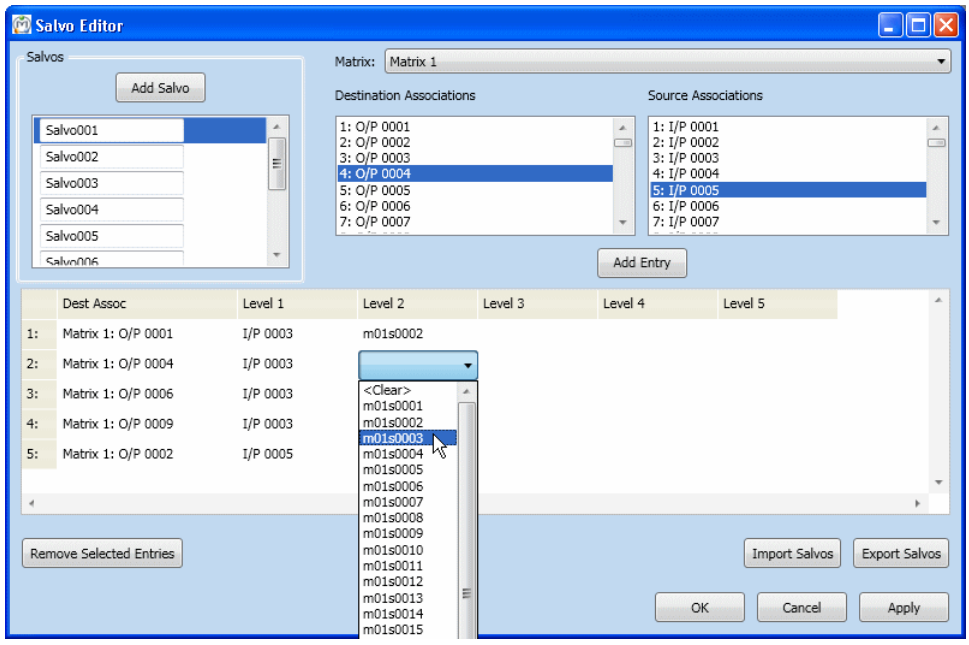

Fig 63. Salvos Editor

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If the number of salvos was set in the Router Configuration (See “Router Configuration” on page 53.), they are listed in the Salvos Editor.

Salvos are commonly used to restore to a known state. For example, to reset an outside broadcast truck to its default settings after returning from a venue.

To create a salvo:

1. Click **Add Salvo**. A new Salvo is added to the Salvos box. By default, salvos follow a naming convention of Salvo001, Salvo002, Salvo003, and so on.
2. Select the required matrix from the drop-down list.
3. Select a **Destination Associations** and a **Source Associations**.
4. Click **Add Entry**. The selection displays in the crosspoint list.
5. Continue adding sources and destinations in this way until the salvo is complete.
6. Click **Apply** to save the Salvo.
7. Click **OK** to confirm and close the Salvo Editor.

To rename a salvo:

1. Select the salvo in the Salvos list.
2. Type a new name in the text box below it.

   Alternatively, in the Names Editor, click on the Salvos tab, select the salvo to change and then enter a new name.

To add a crosspoint into a salvo:

1. Select a new destination and source combination.
2. Click **Add Entry**.
3. Click **Apply** to save changes.

To delete a crosspoint from a salvo:

1. Select the crosspoint from the crosspoint list.
2. Click **Remove Selected Entries**, or press the delete key.
3. Click **Apply** to save changes.

To export a salvo for future use:

1. Click on the **Export Salvo** button
2. Navigate to the folder in which to save the salvo, and click **Save**.

To import a salvo:

1. Click on the **Import Salvo** button.
2. Browse to where the salvo is saved, and click **Open**.

Note: A comma-separated list containing salvo names and matrix, level, destination and source indexes can be created externally to Workbench and imported as a salvo.

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5.5.5.6 Icons

Icons are only displayed in Run mode for soft panels. Icons provide a way of visually grouping sources and destinations. For example, a picture of a server can represent all server sources.

Icons are not required, but can help operators recognise key sources and destinations.

- Click **Icons...**

  The Icons Editor window displays.

To add a brush:

1. Type its name in the Brush Name column. The name must be exactly the same as it is in the brush repository.
2. To help with entering the name, click the Brush Repository button and copy the name from the repository.
3. Paste the name in the Brush Name column.

The tabs along the bottom make it possible to select the character format. Adding a Brush Name to one format adds it to all corresponding formats.

In Design mode, set the group behaviors and button behavior, see Table 20.

Group behavior	Button behavior	Icon checkbox
Router BPX	BPX	Show Source/Dest Icon
Router Dial-up	Source	Show Source Icon
	Destination	Show Destination Icon
Router XY	Source	Show Source Icon
	Destination	Show Destination Icon

Table 20. Group and Button Behaviors in Design Mode to Show Icons

5.5.6 Hardware Config

When configuring a Nucleus 2450 controller, there is an additional Hardware Config tab. The settings on this tab provide additional data required by the Nucleus controller, see Fig 64.

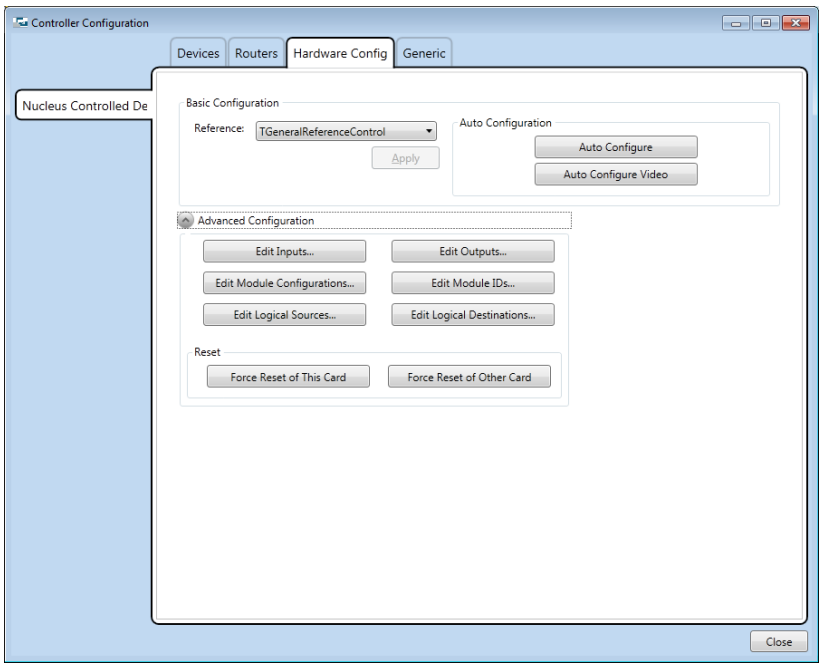

Fig 64. Nucleus 2450 Controller

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The Nucleus 2450 controller can be fitted to Pyxis, Cygnus, and Sirius 800 range of routers.

Note: If Workbench is not connected to the Nucleus card, the auto-configuration option cannot be used. In this case, these settings can either be entered manually or copy and paste the configuration from a spreadsheet.

5.5.6.1 Auto Configuration

In the Configuration section, the **Reference** drop-down list specifies the reference control type. If the Nucleus card is controlling a Cygnus router, set it to TCygnusReferenceControl, for anything else, set it to TGeneralReferenceControl.

Auto Configure and Auto Configure Video

The auto-configure option is used to configure the settings for the Nucleus controller. To auto-configure the settings, connect to the controller and click the **Auto Configure Video** button. Workbench configures these settings based on the detected physical inputs, outputs, and modules.These read back from the matrix the ports and modules installed, and update the configure port and modules.

Auto Configure Video also populates the logical to physical source and destination tables. It configures them to all be of type video with a 1 to 1 mapping so that the physical sources / destinations match the logical sources / destinations.

Auto Configure updates the ports and modules but leaves the logical to physical mapping unchanged. This is often used for audio routers where the logical to physical can be used to configure the router as either stereo or mono. It is also useful if a custom logical-to-physical mapping has been configured on a video router and a reconfigure is required without changing this.

5.5.6.2 Advanced Configuration

Input Ports

If the auto-configure option is used, the number and type of ports are set automatically. Any input ports that are not present, or not recognized, are identified as TUnknownInput.

To manually configure physical input ports:

1. In the **Number of Ports** text field, type the number of physical input ports and then click Apply. The specified number of ports is added to the table.
2. For each input port, select the input type from the drop-down list. Continue adding the input ports in this manner until complete. Or, use the copy and paste function to complete the entries.
3. Click **Apply** or **OK**.

Output Ports

To specify or modify the number and types of physical output ports, click **Edit Outputs…**

If the auto-configure option is used, the number and type of ports are automatically set up. Any output ports that are not present or not recognized are identified as TUnknownOutput.

To manually configure physical output ports:

1. In the **Number of Ports** text field, enter the number of physical output ports and then click **Apply**. The specified number of ports is added to the table.
2. For each output port, select the output type from the drop-down list. Continue adding the output ports in this manner until complete. Or, use the copy and paste function to complete the entries.
3. Click **Apply** or **OK**.

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Module Configurations

Note: The term module refers to the card in a router on which the physical inputs and outputs are situated.

For module configurations for each type of router, see “Routers Reference” on page 206.

Note: If the auto-configuration option is used, the number and types of module configurations are automatically set. Any modules that are not present or not recognized are identified as **TUnknownModule**.

To manually set up module configurations:

1. In the **Number of Configurations** text field, enter the number of module configurations and then click **Apply**. The specified number of configurations is added to the table.
2. For each configuration, select the type from the drop-down list. Continue adding the configurations in this manner until complete. Or, use the copy and paste function to complete the entries.
3. Click **Apply** or **OK**.

Module IDs

- Click **Edit Module IDs...** to specify the number and types of module IDs.

If the auto-configuration option is used, the number and types of module IDs are automatically set up. The only Module ID available is TGeneralModuleID.

There are a few rules that should be adhered to when entering logical sources and destinations.

- The number of physical sources / destinations entered should be based on the signal type selected:

  Video and Audio Mono - 1

  Audio Stereo - 2

  Audio Dolby E - 6

  Additional sources / destinations are ignored.
- Physical sources / destinations should be unique. Entering the same physical source / destination for more then one logical source / destination could result in incorrect tally information.
- The physical source / destination relates to the input and output ports. Therefore, the physical source / destination number specified must be in range of the input / output ports.
- It is not possible to use the logical to physical mappings to configure destinations to follow other destinations because additional source / destinations are ignored. However, one destination can be set to follow another with the Generic Editor, **Destination Follow**.

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Logical Sources

- To specify the logical sources, click **Edit Logical Sources...**

In instances where a signal that comprises more than one physical source, such as the left and right channels of a stereo pair, logical sources are used to identify that they should be routed together. Logical sources can be made up of between one and six physical input sources.

If the auto-configure option is used, the logical sources are automatically set up.

To manually configure logical sources:

1. In the **Number of Sources**, type the required number of logical sources and then click **Apply**. The specified number of logical sources are added to the table. For each logical source, select the signal type from the drop-down list and then type the physical sources that are comprised by the logical source in the Phy 1 to Phy 6 fields. Continue adding the logical sources in this manner until complete, or use the copy and paste function to complete the entries.
2. Click **Apply** or **OK**.

Logical Destinations

- Click **Edit Logical Destinations...** to specify the logical destinations.

In instances where a signal that comprises more than one physical destination, such as the left and right channels of a stereo pair, logical destinations are used to identify that they should be routed together. Logical destinations can be made up of between one and six physical outputs.

If the auto-configure option is used, the logical destinations are automatically set up.

To manually configure logical destinations:

1. In the **Number of Destinations** text field, type the required number of logical destinations and then click **Apply**. The specified number of logical destinations is added to the table.
2. For each logical destination, select the signal type from the drop-down list and then enter the physical outputs that are comprised by the logical destination in the Phy 1 to Phy 6 fields. Continue adding the logical destinations in this manner until complete. Or, use the copy and paste function to complete the entries.
3. Click **Apply** or **OK**.

Force Reset of This Card

To ensure that changes are made to a card, after pushing a database, click the **Force Reset of This Card** (also available on the main configuration screen).

Force Reset of Other Card

This is only relevant in a dual controller system. It connects to one controller and force a reset on the other controller. For example, in a dual controller system when the database has been loaded into the controller, this resets the other controller so that it becomes active.

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5.5.7 Local Router Hardware

When configuring a Centra controller, there is an additional Local Router Hardware tab. The settings on this tab provide additional information that is required by the 246x controller, see Fig 65.

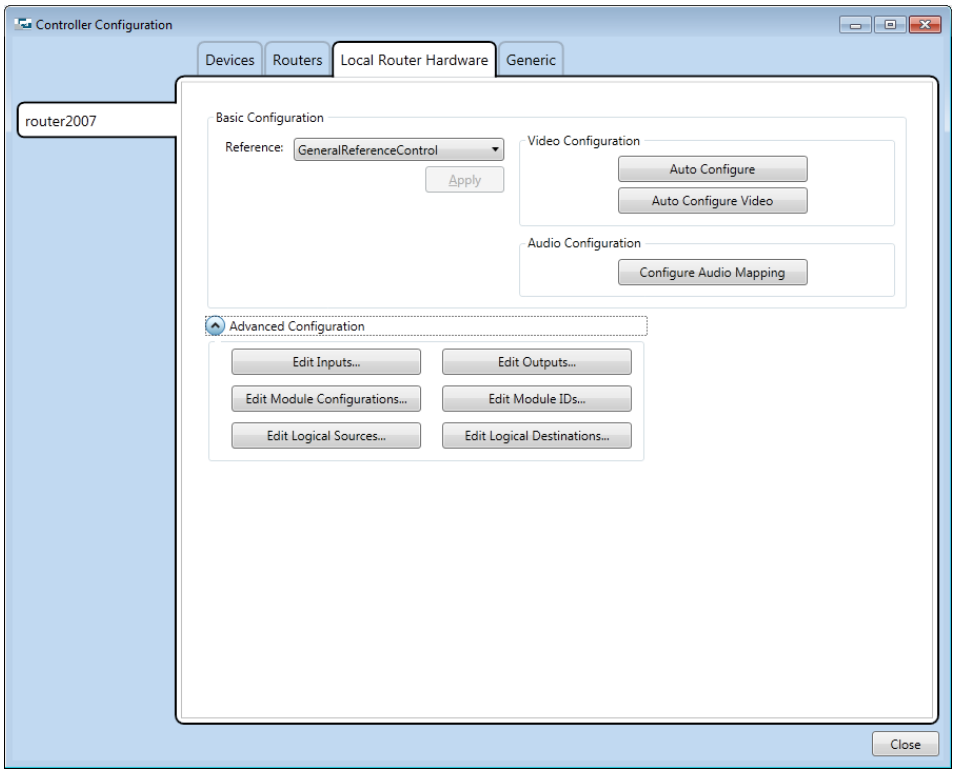

Fig 65. 246x Controller

The 246x controller can be fitted to the Sirius 800 range of Routers.

Note: If Workbench is not connected to the 246x controller card, the auto-configuration option cannot be used. In this case, these settings can either be entered manually or copy and paste the configuration from a spreadsheet.

5.5.7.1 Reference Control

- Click the **Reference** drop-down list and select a reference control type.

  If controlling a Cygnus router, set it to TCygnusReferenceControl, for anything else, set it to TGeneralReferenceControl.

5.5.7.2 Video Configuration

The auto-configure option is used to configure the settings for the 246x controller.

To auto-configure the settings:

- Connect to the controller and click the **Auto Configure Video** button.

  Workbench configures these settings based on the detected physical inputs, outputs, and modules. These read back from the matrix the ports and modules installed, and update the configure port and modules.

  Auto Configure Video populates the logical to physical source and destination tables. It configures them to all be of type video with a 1 to 1 mapping so that the physical sources / destinations match the logical sources / destinations.

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5.5.7.3 Audio Configuration and Mapping

For any logical input and output that is required to have the audio crosspoint control, the number of signals associated with each is required.

Note: An extra Port Configuration in the router configuration must be added for each level. See “Port Configuration” on page 56.

- Click **Configure Audio Mapping** to open the Audio Mapping Configuration window. Setup the audio mapping through the tabs.

Note: The audio configuration should be performed within the video matrix.

A filter is available in a number of the tabs to quickly find sources and destinations.

- Enter alphanumeric characters into the search bar (for example, “VTR”, or “Edit 1”) and click on the **Filter** button. The display changes to show only the items containing the filter text in the source or destination name.
- Click on the **Clear** button to remove a filter.

Fig 66. Filter

Source Sizes

Each incoming video stream is capable of carrying up to 32 embedded audio channels. However, it is unlikely that each source will need that capability. So, to optimize the system, source sizes should only be set for the system cards carrying embedded or discrete audio.

Note: Input sources are likely to be in groups of 24 (the number of AES inputs per card).

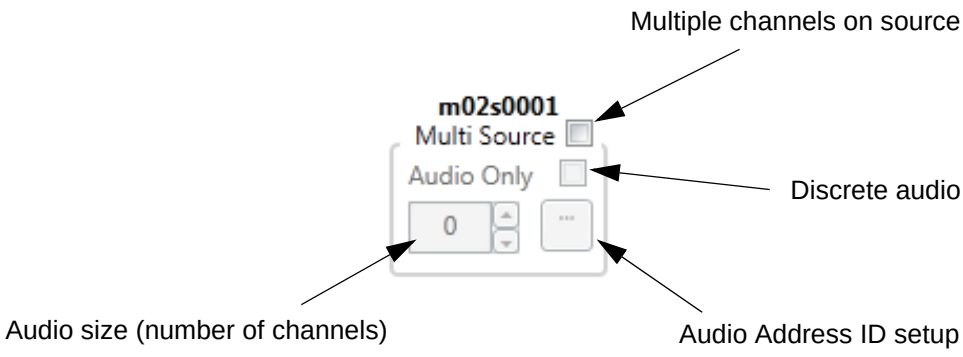

Fig 67. Source Size

Audio source sizes can be set individually, or multiple audio source sizes in a level can be set, when the sizes are to be same across the level, or part of the level.

To setup an individual audio source size:

1. Check the Multi Source checkbox.
2. If the input source is discrete audio, rather than audio embedded in a video input, check the Audio Only checkbox.
3. Select the number of inputs according to the following:

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Mono	1
Stereo	2
SD/HD	16
3G	32
MADI	56/64 - Note: there are only 12 inputs per card using MADI

The default is 0 (zero).

4. Click on the ... button to set Audio Address IDs (these are mono audio addresses).

   The Edit Audio Addresses screen displays.

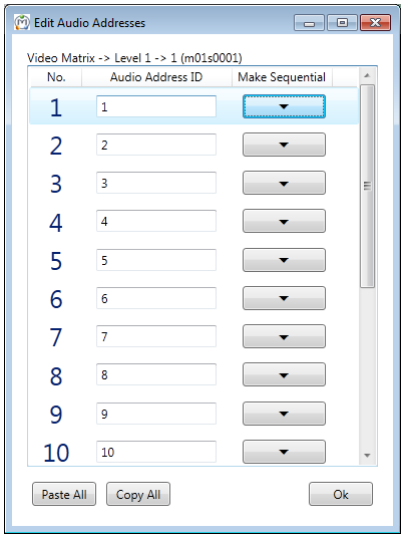

Fig 68. Audio Address IDs

5. Enter an ID number in the first address box.
6. Click on the **Make Sequential** button ( ) immediately to the right of the address ID entered, to automatically fill the remaining addresses for the current port, if they are contiguous.
7. Click **OK**.

Note: It is good practice to number the address IDs according to the maximum number of possible inputs regardless of how many inputs are selected. For example, if video port 1 has audio addresses set to 1-16, video port 2 should have audio addresses set to 33-49.

To setup multiple source sizes:

1. Click on Apply to Matrix at bottom of the screen.
2. Setup the audio sizes across all levels in the same way in steps 1 - 3 for setup of an individual audio source.
3. Check the Set Addresses checkbox.
4. Enter a starting Address ID.
5. Change the offset, if necessary (for example, 4 for AES, 16 for MADI). Default is 32.
6. Either, click on the **Set Visible Rows** button to apply the settings to all rows as defined by the current filter, or select rows using the CTRL and Shift keys in conjunction with the mouse, in the normal manner and click on the **Set Selected Matrix Rows** button.

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Destination Sizes

As with sources, destinations should also be setup for the size of output. The setup method is identical to that of the source sizes.

Safe Sources

A safe source is required for each level on each matrix. This default channel must be applied when there is no other audio routed to a destination track. For example, when a destination program set is larger than the source routed to it, safe sources are used to fill the empty audio tracks.

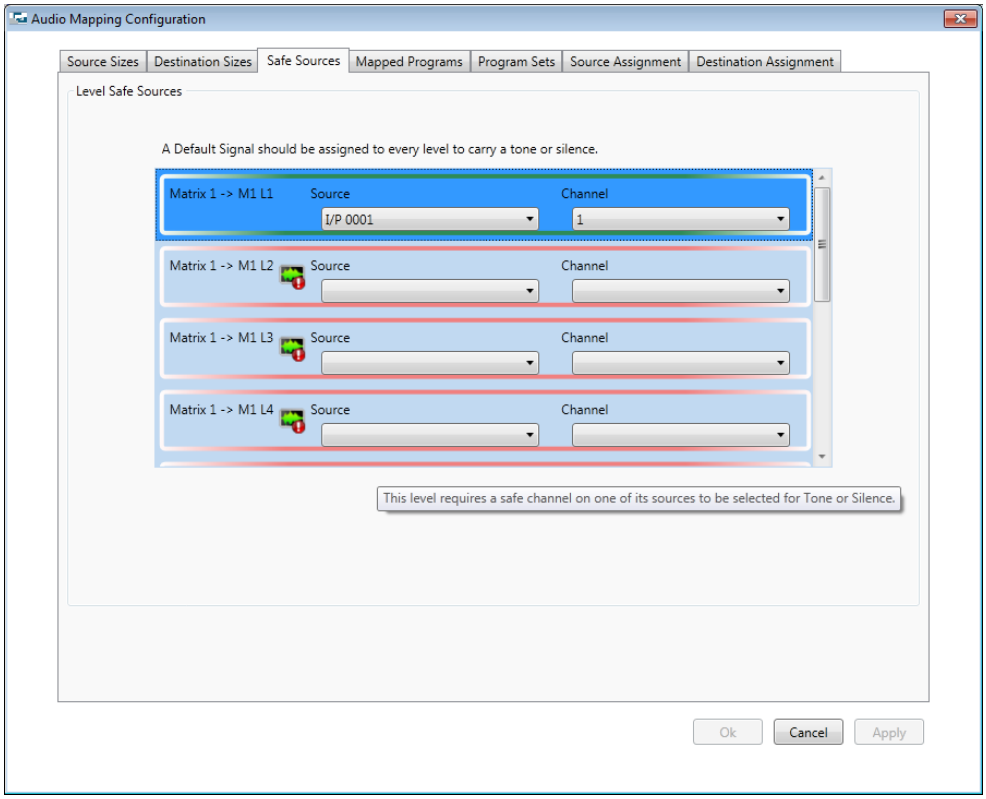

Fig 69. Safe Sources

1. Select a Source from the drop-down box.
2. Select a Channel from the source to select a default audio signal, for example a tone, or silence.

Levels that do not have a safe source attributed to them display next to the level name, indicating that a safe source needs to be setup for that level.

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Mapped Programs

Mapped Programs are a groups of contiguous channels that are routed together when a source and destination in a mapped program are routed. Mapped Programs is used to configure the names that display in the track routing screen. Assignments are setup in the Program Sets tab. See “Program Sets” on page 77.

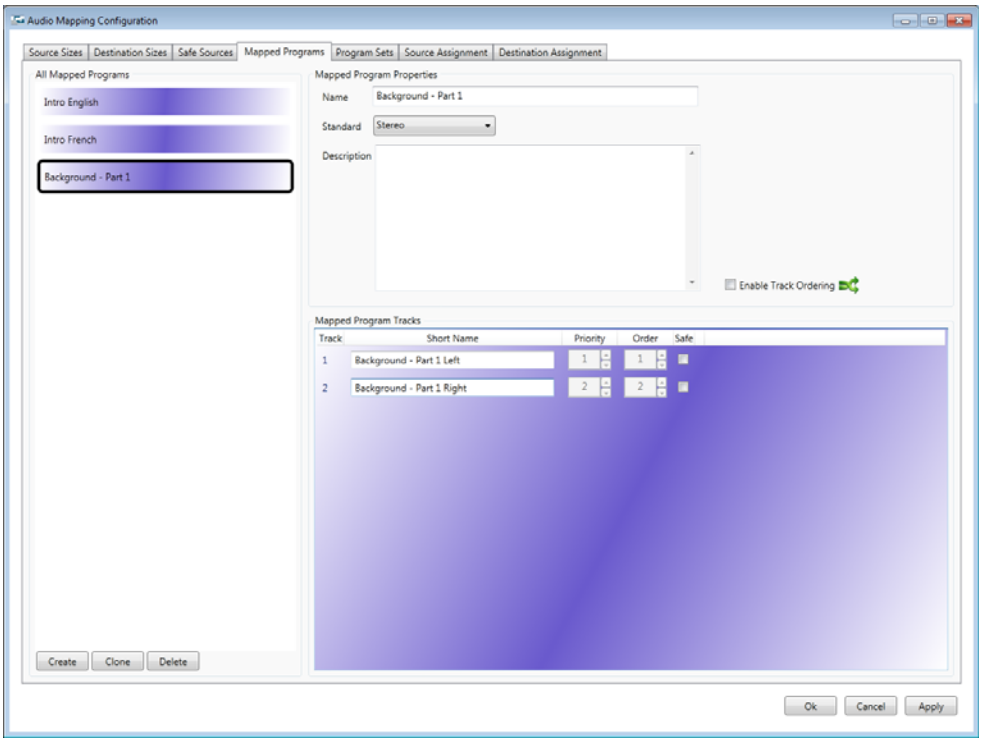

Fig 70. Mapped Rrograms

To add a new Mapped Program:

1. Click on the **Create** button (or the **Clone** button if defining a Mapped program that is similar to an existing one).
2. Type a name for the Mapped Program.
3. Select a standard from the drop-down list. See Table 21.

   This defines the number of channels available in the mapped program.

Standard	Channels	Description
Mono	1	Single audio channel
Stereo	2	Stereo pair
PCM51	6	PCM 5.1 encoded
PCM71	8	PCM 7.1 encoded
User	1-32	User-defined channels

Table 21. Audio Standards

4. Add a relevant description, if required.
5. Enter short names for each channel.
6. Determine a priority for each channel, if required.

   Setting priorities is useful when routing from a larger source to a smaller destination group, ensuring that the correct channels are routed.

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When setting priorities, ensure that each channel is given a unique priority number, otherwise the error icon ( ) displays and the channels will not map correctly.

A red outline displays around any errors to help determine where the fault is.

7. Determine an order for each channel, if required.

   Setting a channel order is useful for shuffling channels when routed.

   The Enable Track Ordering checkbox must be checked before ordering the channels.

   When setting channel ordering, ensure that each channel is given a unique order number, otherwise the error icon ( ) displays and the channels will not map correctly.

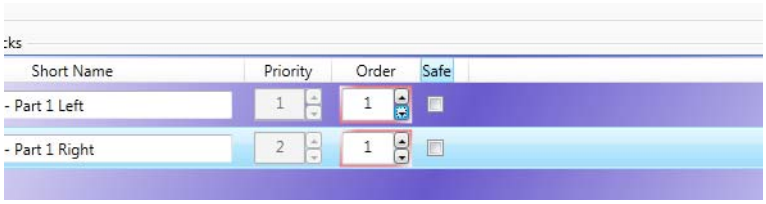

Fig 71. Example Error

A red outline displays around any errors to help determine where the fault is.

8. Check the Safe checkbox of a channel that does not require routing.

   Where channels are set to “Safe” the safe source for that level is routed.

Program Sets

Combine Mapped Programs and single channels into sets for frequently used setups.

A maximum of 64 channels (32 channels of embedded audio, or 64 MADI) can be grouped and routed together before being assigned to both sources and destinations.

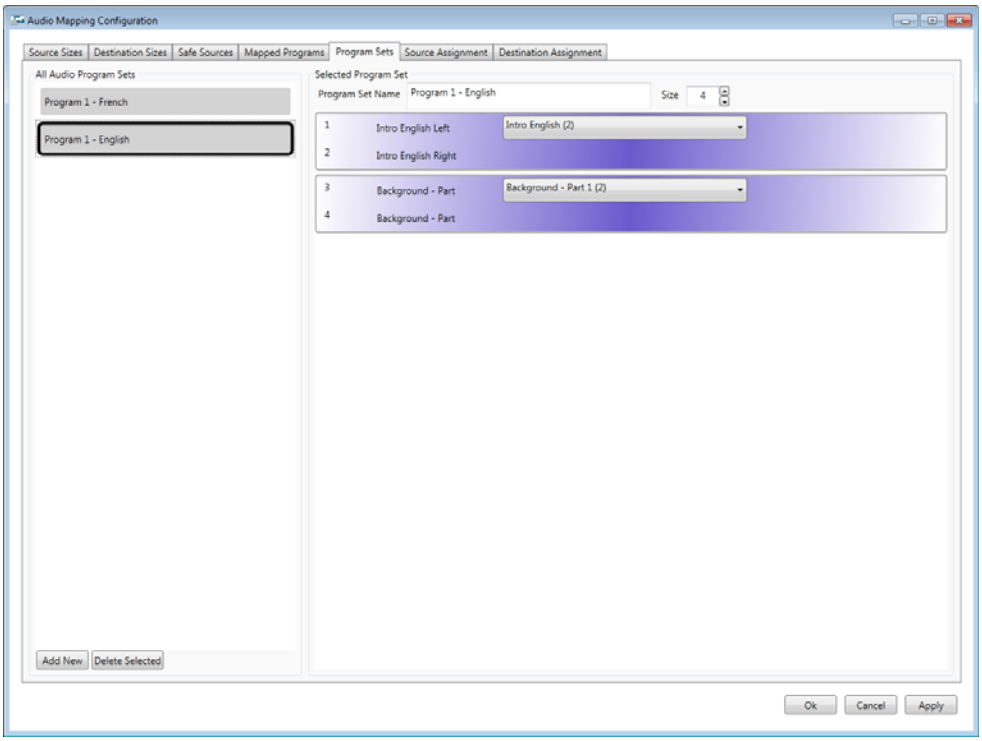

Fig 72. Program Sets

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To create a Program Set:

1. Type a name for the Program Set.
2. Set the size of the Program Set, making sure that the size is large enough to accommodate all the Mapped Programs required.
3. Click on the drop-down box on a channel and select the Mapped Program to add to that channel (and the number of channels below depending on the audio standard of the mapped program selected).
4. Add a further description title, if required.
5. Repeat for as many Mapped Programs as required for the set.

   When setting a Program Set, ensure that each channel is given a unique order number, otherwise the error icon ( ) displays and the channels will not map correctly.

Source Assignment

To assign a Program Set to an input:

- Click on the drop-down menu for an input, and select a Program Set.

  Repeat for other inputs as required.

Note: If a size has not been attributed to a source, or the source is video only, then it is not possible to assign a Program Set to that source.

Destination Assignment

To assign a Program Set to an output:

- Click on the drop-down menu for an output, and select a Program Set.

  Repeat for other outputs as required.

Note: If a size has not been attributed to a destination, or the destination is video only, then it is not possible to assign a Program Set to that destination.

5.5.7.4 Advanced Configuration

Input Ports

If the auto-configure option is used, the number and type of ports are set automatically. Any input ports that are not present, or not recognized, are identified as TUnknownInput.

To manually configure physical input ports, before going online:

1. In the **Number of Ports** text field, type the number of physical input ports and then click **Apply**. The specified number of ports is added to the table.
2. For each input port, select the input type from the drop-down list. Continue adding the input ports in this manner until complete. Or, use the copy and paste function to complete the entries.
3. Click **OK**.

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Output Ports

- To specify or modify the number and types of physical output ports, click **Edit Outputs…**

If the auto-configure option is used, the number and type of ports are automatically set up. Any output ports that are not present or not recognized are identified as TUnknownOutput.

To manually configure physical output ports:

1. In the **Number of Ports** text field, enter the number of physical output ports and then click **Apply**. The specified number of ports is added to the table.
2. For each output port, select the output type from the drop-down list. Continue adding the output ports in this manner until complete. Or, use the copy and paste function to complete the entries.
3. Click **OK**.

Module Configurations

Note: The term module refers to the card in a router on which the physical inputs and outputs are situated.

For module configurations for each type of router, see “Routers Reference” on page 206.

Note: If the auto-configuration option is used, the number and types of module configurations are automatically set. Any modules that are not present or not recognized are identified as **TUnknownModule**.

To manually set up module configurations:

1. In the **Number of Configurations** text field, enter the number of module configurations and then click **Apply**. The specified number of configurations is added to the table.
2. For each configuration, select the type from the drop-down list. Continue adding the configurations in this manner until complete. Or, use the copy and paste function to complete the entries.
3. Click **OK**.

Module IDs

- Click **Edit Module IDs...** to specify the number and types of module IDs.

If the auto-configuration option is used, the number and types of module IDs are automatically set up. The only Module ID available is TGeneralModuleID.

There are a few rules that should be adhered to when entering logical sources and destinations.

- The number of physical sources / destinations entered should be based on the signal type selected:

  Video and Audio Mono - 1

  Audio Stereo - 2

  Audio Dolby E - 6

  Additional sources / destinations are ignored.

- Physical sources / destinations should be unique. Entering the same physical source / destination for more then one logical source / destination could result in incorrect tally information.

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- The physical source / destination relates to the input and output ports, that are defined. Therefore, the physical source / destination number specified must be in range of the input / output ports.
- It is not possible to use the logical to physical mappings to configure destinations to follow other destinations because additional source / destinations are ignored. However, one destination can be set to follow another with the Generic Editor, **Destination Follow**. See “Generic Editor” on page 94.

Logical Sources

- To specify the logical sources, click **Edit Logical Sources...**

In instances where a signal that comprises more than one physical source, such as the left and right channels of a stereo pair, logical sources are used to identify that they should be routed together. Logical sources can be made up of between one and six physical input sources.

If the auto-configure option is used, the logical sources are automatically set up.

To manually configure logical sources:

1. In the **Number of Sources**, type the required number of logical sources and then click **Apply**. The specified number of logical sources are added to the table. For each logical source, select the signal type from the drop-down list and then type the physical sources that are comprised by the logical source in the Phy 1 to Phy 6 fields. Continue adding the logical sources in this manner until complete, or use the copy and paste function to complete the entries.
2. Click **Apply** or **OK**.

Logical Destinations

- Click **Edit Logical Destinations...** to specify the logical destinations.

In instances where a signal that comprises more than one physical destination, such as the left and right channels of a stereo pair, logical destinations are used to identify that they should be routed together. Logical destinations can be made up of between one and six physical outputs.

If the auto-configure option is used, the logical destinations are automatically set up.

To manually configure logical destinations:

1. In the **Number of Destinations** text field, type the required number of logical destinations and then click **Apply**. The specified number of logical destinations is added to the table.
2. For each logical destination, select the signal type from the drop-down list and then enter the physical outputs that are comprised by the logical destination in the Phy 1 to Phy 6 fields. Continue adding the logical destinations in this manner until complete. Or, use the copy and paste function to complete the entries.
3. Click **Apply** or **OK**.

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Derived References

To configure Derived References offline:

1. Click **Edit Derived References...** to define internal references derived from the physical reference inputs.
2. Select the Input reference from the drop down list. This will either be a physical input via BNC, or a reference that is derived from another input.
3. Select the required derived reference from the drop-down list.
4. Select the required reference for audio from the drop-down list.
5. Select the reference rate for audio from the drop-down list.
6. Click **OK**.

Note: Derived references are changed online using the relevant run screens (S800 databases only).

5.6 Configuring Panels

5.6.1 Panel Device

A Panel Device relates to a physical hardware device, for example, a control panel. Control panels are configured for use with the router to which they are connected, and then setup using on-screen hardware panel templates.

There are two areas in Workbench that are relevant to Hardware Panels:

- **Configuration** - A port on a router controller can be configured to communicate with Panel Devices.

  When configuring a Hardware Panel, set a router COM port to ptMultiDropFullDuplex.

- **Design** - The functionality of the Hardware Panels are set in the design mode.

  Workbench provides several screen files, each of which is a template for a particular type of panel. These screen files can be imported to Workbench designer so that panels and keypads can be easily configured.

Note: For paired controllers, a new panel can only be created for the primary controller.

There are several ways to create a hardware panel:

- Configure a router controller to be a panel device, then create the panel through the panels wizard.
- Select one of the pre-defined panels in design mode and link it to a router controller.
- Create a panel in design mode and link it to a router controller.

Note: By default, Run Mode is disabled for hardware panels. Running a hardware panel displays an error stating that the initial screen is disabled. This option is changed in the screen properties window.

The hardware panel requires a valid controller, with a panel and keypad, see “Hardware Panels Reference” on page 220.

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5.6.1.1 Configuring a Router Controller as a Panel Device

To edit the controller:

1. Open the Configuration window.

   To access the Configuration screen, log in as a user with Configuration permissions, see section 4.3.

2. Select the controller and click the **Edit Controller Config...** button. The Controller Configuration window displays. The tabs that are available depend on the type of controller.

3. Select the **Devices** tab.

4. Check the PanelDevice checkbox.

   The Panels configuration has two buttons:

   - **Add Panel...—**starts the **Add Hardware Panels Wizard**, see section 5.6.1.2.
   - **Configure Panels...**—opens the **Hardware Panels Configuration Editor**, see section 5.6.1.3.

5.6.1.2 Add Hardware Panel Wizard

The Add Hardware Panel Wizard lists several pre-defined screens for creating a layout that has several parameters already configured.

For each new panel the wizard adds a screen with the following:

- Controller: The behavior of the panel is set to the controller being configured.
- Keypad: Each new keypad is labeled “Keypad1”, “Keypad2”, and so on.
- Panel: Each new panel is labeled “Panel1”, “Panel2”, and so on.
- Source Sequence Set (For XY dial-up and multi-bus panels): New Sequence sets are labeled “Sequence3”, “Sequence4”, and so on.
- Destination Sequence Set (For XY dial-up panels only).

To add a new panel through the wizard:

1. Either select a screen from the list, or click the button to browse to an existing saved screen.

2. Type a name for the panel.

3. Click the **Create Screen and Edit Panel** button. The wizard displays in Design mode with the selected screen.

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5.6.1.3 Hardware Panels Configuration Editor

In the Configuration window, the Hardware Panels Configuration Editor is for configuring the number of panels, keypads, sequence sets, and communication ports.

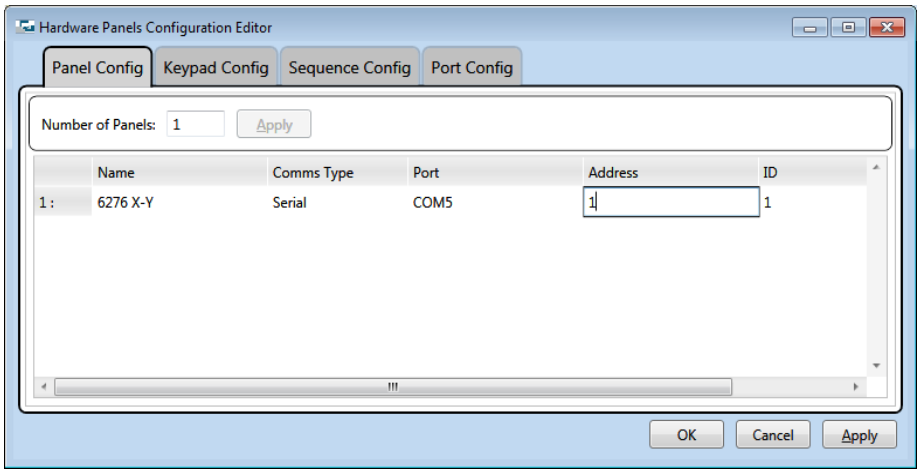

Fig 73. Panels Configuration Editor

Panel Config

These settings configure the number of physical control panels in the system. Table 22. lists the Panel Config options.

Column	Description
Number of Panels	To specify the number of panels in the system, enter the number of panels and then click **Apply**. For each panel, a row is added to the editor.
Name	The name of the panel.
Comms Type	Either **Serial** or **IP**. Select the appropriate type from the drop-down list. If IP is selected, the Address is updated automatically. Unused panels should be set to “Unassigned”.
Port	The port on which the controller communicates with the panel. The default port number is 3010. The ports are defined from the Port Config tab. “Port Configuration” on page 56. **Note**: There is no internal mechanism to ensure that the specified COM port is not already in use.
Address	Enter an address for each panel. The address must match the address switches on a physical card.
ID	An ID is automatically attributed when using the panels wizard. If required, change the ID of a panel. The same ID may be attributed to more than one panel, if required.

Table 22. Panel Configuration Settings

Keypad Config

These settings configure the number of keypads in the system. The number of keypads required depends on the type of control panel, and how the specific panels are used. A single keypad can be used on more than one panel. Table 23. lists the Keypad Config options.

Column	Description
Number of Keypads	To specify the number of keypads in the system, enter the required number and then click **Apply**.
Name	The name of the keypad.

Table 23. Keypad Configuration Settings

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A dial-up keypad is configured such that a mnemonic or number is assigned to a button. The sources and/or destinations can then be selected by making a single, or series of, button presses to select an input or output.

A keypad that dials up sources only requires a single SourceKeypad sequence set. A keypad that dials up destinations only requires a single DestinationKeypad sequence set. If a panel dials up both sources and destinations, it requires both a SourceKeypad sequence set and a DestinationKeypad sequence set.

Sequence Config

In the Configuration Window, these settings configure the number of sequence sets in the system. Sequence sets group the key sequences (defined in Design mode) that are required to enter sources and destinations. Table 24. lists the Sequence Config options.

Column	Description
Number of Sequence Sets	To specify the number of sequence sets available in the system, enter the required number and then click **Apply**.
Name	The name of the sequence set.
Type	For each sequence set, select a type from the drop-down list: • SourceKeypad • DestinationKeypad • SoftSourceKeypad • SoftDestinationKeypad

Table 24. Sequence Configuration Settings

Port Config

In the Configuration window, the Hardware Panels - Port Config tab specifies which COM port on the host machine is set to communicate with the controller.

Note: Do not confuse the ports listed in the Hardware Panels Configuration editor with the ports listed in the Router Controller.

Column	Description
Available Ports	The available COM ports are displayed on the left of the window. Click **Interrogate Ports** to update the list of available ports. **Note**: The list of ports is not automatically updated: Manually interrogate the ports to ensure that the list is up-to-date.
Add	Click **Add** to transfer the port to the Serial Ports Configured section.
Assign	To change the configured port, select a port from the Available column and a Configured port, and click **Assign**.
Serial Ports Configured	For each port in the Serial Ports Configured section, select a Protocol, Baud Rate, and Flags.
Protocol	The available options are: • ptUndefined • ptMultiDropFullDuplex • ptMultiDropHalfDuplex
Baud Rate	Do not change the Baud Rate from 38400. The only exception is when using extremely long cable lengths, and then the baud rate must be set to 9600.

Table 25. Port Configuration Settings

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Column	Description
Flags	The Flags options are advanced settings and should normally be left unselected: • Embedded Polls: Embeds polls in the message queue. • Ignore Inhibits: Causes the controller to ignore any routes inhibits that have been specified in the database.
IP Panels	Check the checkbox to Enable IP Panels. The default port number is 3010. If a configuration or database already exist, this will be set to -1.

Table 25. Port Configuration Settings

5.7 Configuring Additional Devices

Further devices types may be added to a controller. The devices that are available depend on the controller type:

- Nucleus Controller (2450): This is a controller, configured as a Router controller, and Panels device only.
- Centra Controller (2330/246x/PC): This is a hardware controller that can be configured as any combination of devices, see Table 26.

Note: Some devices cannot be configured on the same controller as other devices. See Table 26. for compatibility.

5.7.1 Add a New Device to the Controller

To add a device:

1. Click on the Devices Tab.

   The current devices assigned to the controller display on the left-hand side of the screen.

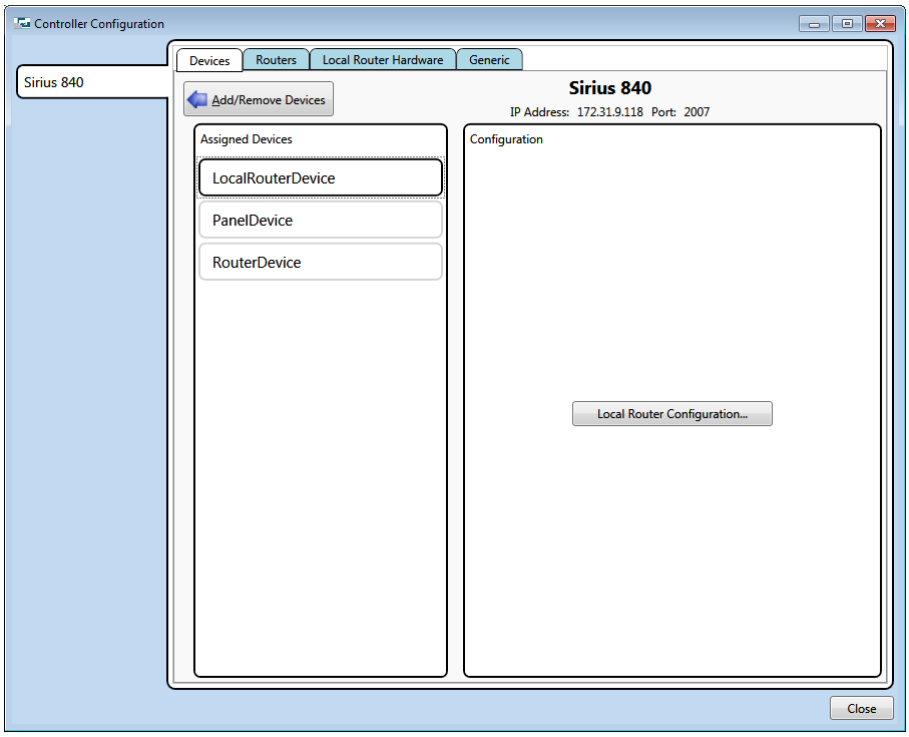

Fig 74. Devices Tab

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2. Click on the **Add/Remove Devices** button.

   The screen now displays the current devices on the right-hand side of the screen, with a list of the available devices displayed on the left-hand side of the screen.

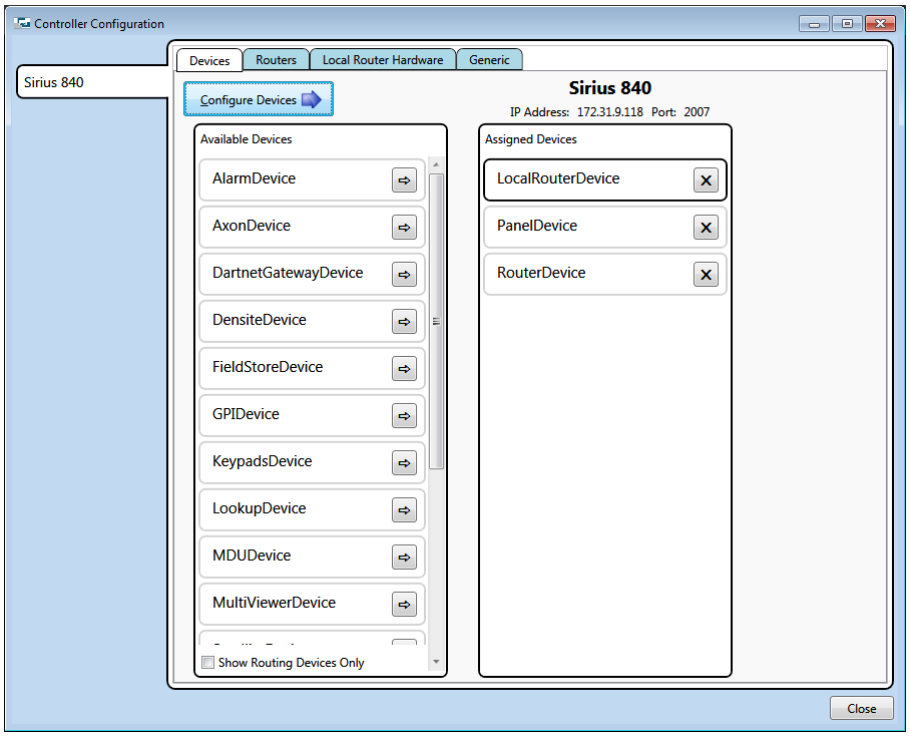

Fig 75. Add/Remove Devices

3. Further devices can be viewed by unchecking the Show Routing Devices checkbox.

4. Click on the button of the required device.

   The device name moves from the Available Devices field to the Assigned Devices field on the screen.

5. Add further devices, if required, in the same manner.

6. Click on the **Configure Devices** button.

   This returns to the previous screen, allowing for configuration of the new device(s).

7. Select the appropriate device, and then click on the relevant **Configure...**, **Edit...**, or **Add...** button on the right-hand side of the screen.

Note: Some devices cannot be configured from this screen, and do not display any buttons on the right-hand side of the screen. Such devices must be configured using the Generic Editor. See “Generic Editor” on page 94.

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5.7.2 Available Devices

The Devices tab specifies the type of device or devices that are to be controlled. Table 26. lists the options for a generic controller:

Device	Description
AlarmDevice	For creating local alarms and reporting to Workbench alarm screens, see section 5.7.3
AxonDevice [1]	Required to connect to Axon modular with supported modules, see section 5.8.1
DartNetGatewayDevice [1]	Required to connect to Vistek modular – requires CANUSB adapter on PC – can only run on PC not dual redundant, see section 5.8.1
DensiteDevice [1]	Miranda protocol for modular, see section 5.8.1
FieldStoreDevice	For use as a transient data storage controller – allows use of screen recall, strings and passing of values to rules service, see section 5.7.4
GPIDevice	For configuring GPIs, currently on 2330 only, see section 5.7.5
KeypadsDevice [1]	Required for soft panel keypad setup and re-use, see section 5.8.1
LocalRouterDevice	Audio router configuration, see section 5.5.1
LookupDevice [1]	Used to define lookup tables for cases where a value needs translating to another value, see section 5.8.1
MDUDevice [1]	SNMP interface to GPI collator (TSL MDU box), see section 5.8.1
MultiViewerDevice [1]	To connect to multiviewers and allow screen recalls etc. Currently only supports Miranda and Snell Multi-Viewers, see section 5.8.1. For a worked Example of setting up a Multiviewer, see “Configure a MultiViewer” on page 160
PanelDevice	For configuration of hardware control panels, needed on Nucleus 2450 or with 2330/246x. This must be on the same controller as a Router Device, see section 5.6.1
RouterDevice	For controlling one or more routers, see section 5.5
SatelliteDevice [1]	Interface for satellite positioning control, see section 5.8.1
SNMPGenDevice [1]	Control devices via SNMP, see section 5.8.1. **Note:** Associated MIB files are required.
SourceQueueDevice [1]	Not for general use - required for reverse mimic chains and queuing sources to feed to a clean feed path, see section 5.8.1
TestDevice	Not for general use. May be used for a controller that is no longer required. **Note**: If this device is in use, DO NOT DELETE
TielinesDevice	Tie-line controller talks to one or more router drivers to make tie-line routes, required for mimic diagram, see section 5.7.6 **Note**: A Tie-Lines Device cannot be on the same controller as a Router Device with which it communicates, or on the same controller as a UMDEngineDevice.

Table 26. Available Devices

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Device	Description
UMDDevice	Sending names to an Under Monitor Display (UMD) currently supports 8+ protocols, different strings over IP and serial ports, see section 5.7.7 **Note**: A UMD Device cannot be on the same controller as a UMDEngineDevice.
UMDEngineDevice	Communicates with a Tie-lines device. The UMD Engine provides a mechanism to automatically update the text displayed on the UMDs with the destinations source name in the tieline tally table, see section 5.7.8 **Note**: A UMDEngineDevice cannot be on the same controller as a UMDDevice.
VideoPlayoutDevice [1]	For connecting to VTRs / video servers, see section 5.8.1

Table 26. Available Devices

[1] Devices that do not have their own configuration wizard must be configured using the Generic Editor. See “Generic Editor” on page 94.

More than one device can be selected for each controller. However, some devices cannot run on the same port. For example, a Tie-Lines device cannot be on the same port as a UMD Engine device.

5.7.3 Alarm Device

An alarm device is one that creates local Workbench alarms, and reports them to Workbench alarm screens.

- Select AlarmDevice, and click on the **Edit Alarms...** button.

  The Alarm controller screen displays.

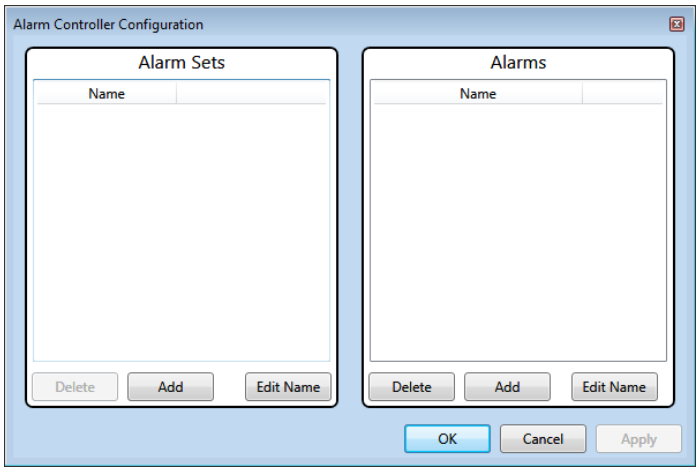

Fig 76. Alarm Configuration Screen

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To add alarms:

1. Click on the **Add** button for the Alarm Sets field. An **[unnamed]** alarm set is added.
2. Click on the **Edit Name** button to attribute a name to the Alarm Set.
3. Click on the **Add** button for the Alarm field. An **Alarm1** alarm is added.
4. Click on the **Edit Name** button to attribute a name to the Alarm.

   Further alarms may be added to the set and renamed accordingly. Further Alarm Sets may also be added, if required.
5. Click **OK** when all alarms and alarm sets have been added.

The individual alarms must be setup using the Generic Editor, under the Devices branch. See “Generic Editor” on page 94.

5.7.4 FieldStore Device

A FieldStore Device makes it possible to define DCCP database fields. Typically, to pass values between soft panels, see section A.5.

- To open the Fieldstore Editor, click the **Edit Fieldstore...** button.

  The Fieldstore Editor screen displays.

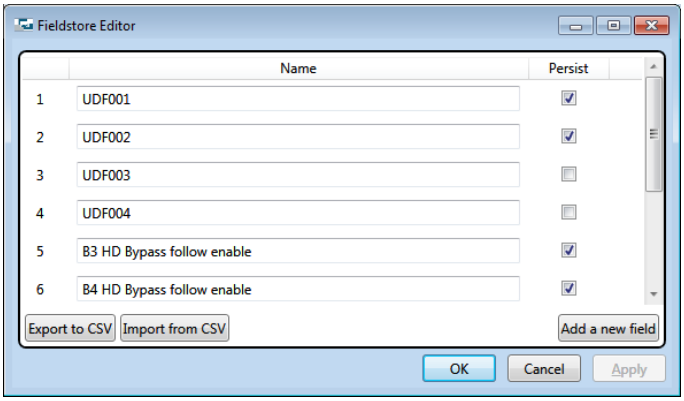

Fig 77. FieldStore Editor Screen

To add a field:

1. Click the **Add New Field** button. A new field is added to the list.
2. Type a Name.
3. If required, select whether the FieldStore should persist - this determines whether the value is remembered if the controller is restarted and it powers up in the same state.

   FieldStore names, settings and values may be exported and imported to and from a .CSV file.

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5.7.5 GPI Device

These settings configure the number of General Purpose Interfaces in the system. On a 2330 controller this can be up to 16 GPIs. By using the maximum of 3 additional expansion cards, up to 160 GPIs are available (48 per expansion card).

- Select GPIDevice and click the **Edit GPIs...** button.

  The GPIs Editor screen displays.

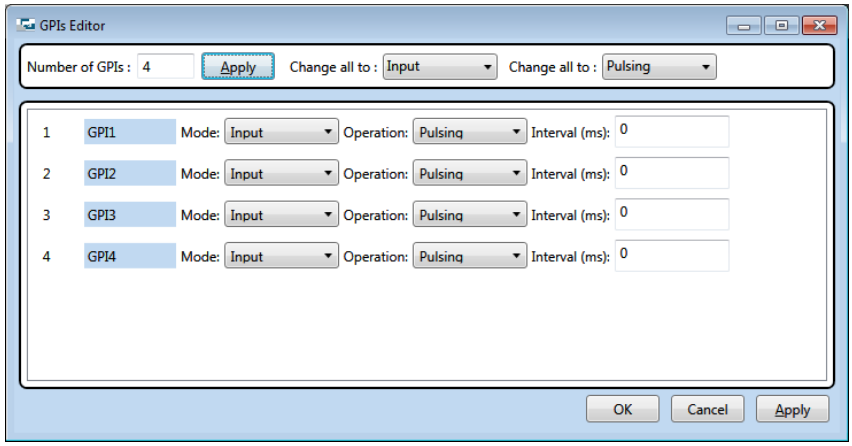
GPIs Editor
Number of GPIs : 4
Apply
Change all to : Input
Change all to : Pulsing
1 GPI1 Mode: Input Operation: Pulsing Interval (ms): 0
2 GPI2 Mode: Input Operation: Pulsing Interval (ms): 0
3 GPI3 Mode: Input Operation: Pulsing Interval (ms): 0
4 GPI4 Mode: Input Operation: Pulsing Interval (ms): 0
OK
Cancel
Apply

Fig 78. GPIs Editor Screen

To add GPIs:

1. Enter a value in the Number GPIs field at the top of the screen, and click the Apply button.

   For each GPI a separate row is displayed to the editor.

2. Specify the Mode from the drop-down list in the GPI row, either input or Output, for each of the GPIs.

   If all GPIs are to be set the same, use the Change all to: field at the top of the screen, and select the mode from the drop-down list.

3. Specify the Operation from the drop-down list in the GPI row, either Pulsing or Latching, for each of the GPIs.

   If all GPIs are to be set the same, use the Change all to: field at the top of the screen, and select the operation from the drop-down list.

   Determine an interval for each GPI (in milliseconds).

When a hardware control panel is in one of the BPX modes it includes a joystick override feature that allows the GPI to be used as inputs. See “GPI Overrides” on page 177.

5.7.6 Tielines Device

A Tie-Line device represents a series of physical cables that connect multiple destinations on one level of a matrix to multiple sources on a another level of the matrix; or other matrix. The tie-line can join video to video, or audio to audio. It cannot connect video to audio.

Tie-Lines can connect to more than one router controller. Up to 40 routers may be added per tie-line engine.

- Select TielineDevice, and click on the **Edit Tielines...** button.

  The Tie Lines Editor displays.

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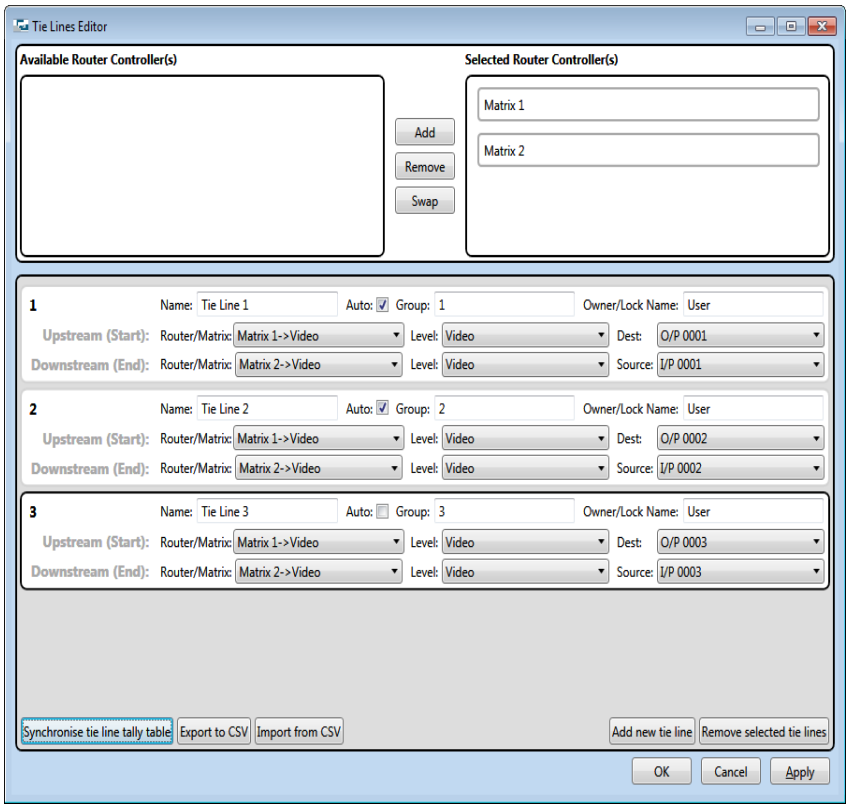
Tie Lines Editor
Available Router Controller(s)
Selected Router Controller(s)
Matrix 1
Matrix 2
Add
Remove
Swap
1 Name: Tie Line 1 Auto: Group: 1 Owner/Lock Name: User
Upstream (Start): Router/Matrix: Matrix 1->Video Level: Video Dest: O/P 0001
Downstream (End): Router/Matrix: Matrix 2->Video Level: Video Source: I/P 0001
2 Name: Tie Line 2 Auto: Group: 2 Owner/Lock Name: User
Upstream (Start): Router/Matrix: Matrix 1->Video Level: Video Dest: O/P 0002
Downstream (End): Router/Matrix: Matrix 2->Video Level: Video Source: I/P 0002
3 Name: Tie Line 3 Auto: Group: 3 Owner/Lock Name: User
Upstream (Start): Router/Matrix: Matrix 1->Video Level: Video Dest: O/P 0003
Downstream (End): Router/Matrix: Matrix 2->Video Level: Video Source: I/P 0003
Synchronise tie line tally table
Export to CSV
Import from CSV
Add new tie line
Remove selected tie lines
OK
Cancel
Apply

Fig 79. Tie Line Editor

To add a Tie-Line:

1. Select a **Router Controller**.
2. Click on the **Add new tie line** button, and set the following information:

Column	Description
Name	The name that identifies the Tie-Line.
Auto	Defines whether a tie-line is used automatically, or not.
Group	Allocates tie-lines to a specific group to ensure that routes are available in smaller sub-sections. For example, if n operators must link to their local monitors, there must be n+1 groups to make sure that each operator has a set number of available tie-lines for their use, regardless of how many tie-lines the other operators are using.
Start Matrix	The matrix on the router from which the signal originates.
Start Level	The level from which the signal originates.
Start Dest	The destination from which the signal originates.
End Matrix	The matrix to which the signal is to be sent.
End Level	The level to which the signal is to be sent.
End Source	The source to which the signal is to be sent.

Table 27. Tie-Lines Configuration

3. Click **Apply** to save the Tie-Line configuration.

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5.7.7 UMD Device

An Under Monitor Display shows the name of a destination, a static text, or a dynamic source name. The UMD can connect either through serial or IP connection, depending on the type.

The UMD Device driver, configures text to display on a UMD. The text can be grouped into logical groups. UMDs can be linked together so that the text simultaneously changes when the group is applied (each UMD must have a different Header number, which is selected through a switch on the front of the UMD).

To add a new group:

1. Click the **Add Group** button. A new group is added to the list, see Fig 80.

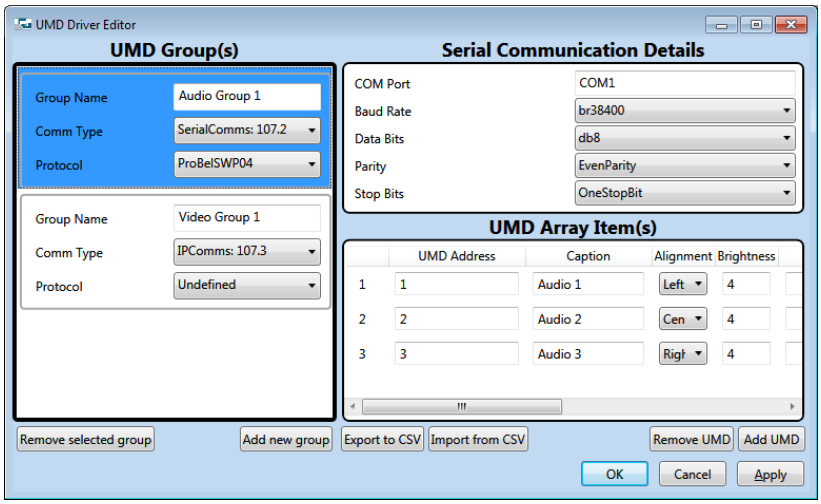

Fig 80. UMD Driver Editor

2. Type a **Group Name**.
3. Select the **Comms Type** from the drop-down list. The options change depending on the selection (there is no automatic check for valid COM ports).
4. Select the **Protocol** from the drop-down list.
5. For each UMD in the group, click **Add UMD**. An entry is added to the list.
6. Enter the UMD Address. Each UMD must have a unique address.

   See the UMD manufacturer's documentation for details.
7. Type the Caption Text to display, its **Alignment**, and **Brightness** (0 = Minimum 8 = Maximum).
8. If required, select up to four tallies.

Dynamic UMDs can be configured to follow tie-lines. See "Configure Dynamic UMDs" on page 184.

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5.7.8 UMD Engine Device

The UMD Engine provides a mechanism to automatically update the text displayed on the UMDs with the destinations source name in the tie-line tally table.

To connect to the Tielines engines and the UMD drivers, configure the UMD Engine to include at least one Tielines engine (see section 5.7.6) and one UMD driver (see section 5.7.7).

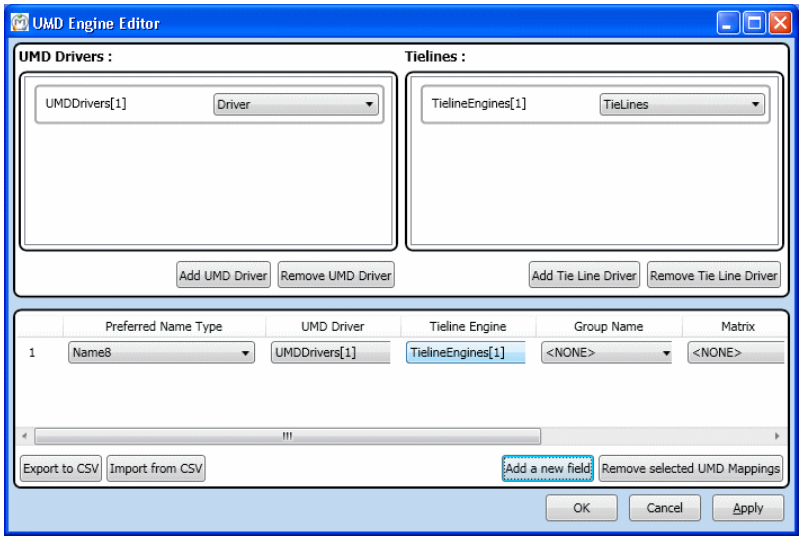

Fig 81. UMD Engine Editor

To add a new UMD driver:

1. Click the **Add UMD Driver** button, and a new driver is added to the list. Select the Driver from the drop-down list.
2. Click the **Add Tie-line Driver** button, and select the Tie-line from the drop-down list.
3. Click the **Add a new field** button, and a new entry is added to the list. Configure the engine as required.

5.8 Controller Configuration Editors

The Generic tab has three buttons:

- Edit Controller - See “Generic Editor” on page 94.
- Edit Controller Online - See “Online Editor” on page 95.
- Checksum - See “Checksum” on page 95.

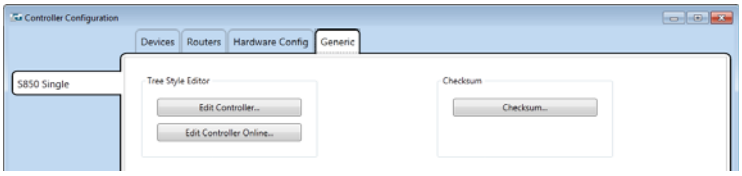

Fig 82. Generic Controller Configuration

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5.8.1 Generic Editor

The Generic Configuration Editor is used to edit a controller in a logical tree structure format, see Fig 83. It can edit or view any controller, but must be used to edit those that do not have a specific GUI such as RollCall controllers, Multiviewers, etc.

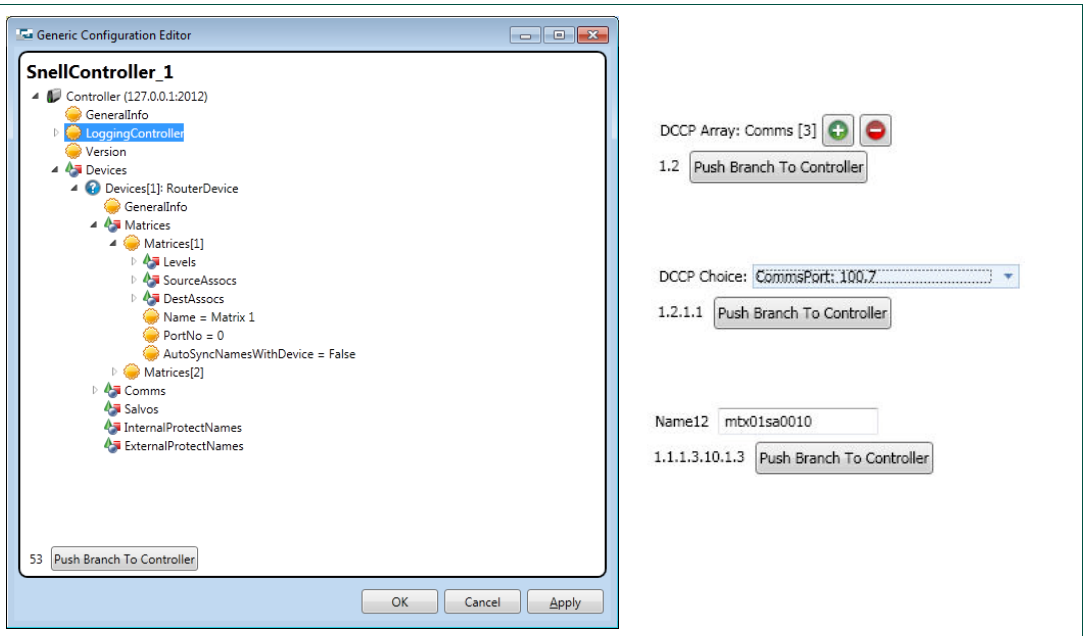

Fig 83. Generic Configuration Editor (Offline)

Important: Care should be taken when using the Generic Editor. It is very easy to change the configuration so that the controller no longer functions correctly, and in a way that is difficult to fault-find. For example, changing the baud rate can stop the controller from communicating correctly, if a device has not had the same change in baud rate.

The controller's configuration parameters display in a tree.

- Click on a ▷ symbol to expand the node below it.
- Click on a ◢ symbol to collapse the node.

The nodes depend on the type of device.

Important: Removing an item from the middle of an array can 'break' the controller and links to soft panels.

There are three types of controls used to build the configuration. Depending on the selection, the appropriate control displays at the bottom of the screen, see Table 28. and Fig 83.

Control	Description
Plus / minus symbols	These controls add or remove an element below the selected node.
Drop-down lists	If the selected configuration parameter is defined by a set group of choices, a drop-down list enables the value to be selected.
Text boxes	If the selected configuration parameter requires a name, a text box enables the name to be entered.

Table 28. Generic Configuration Controls

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5.8.2 Online Editor

The Online Editor displays the current configuration status of the live system. It is mainly used for diagnostic purposes to identify failures.

Important: Any changes made to the configuration in the Online Editor occur in real-time on a live controller. It is generally recommended that configuration changes are made using the Generic Editor.

The Online Editor must be also used for auto-detection of modular systems.

5.8.3 Checksum

The **Checksum** button, when clicked, displays the Checksum Information screen. The information displayed in this screen is mainly for diagnostic purposes.

- Click the **Interrogate** button and the checksum information for the current controller displays.

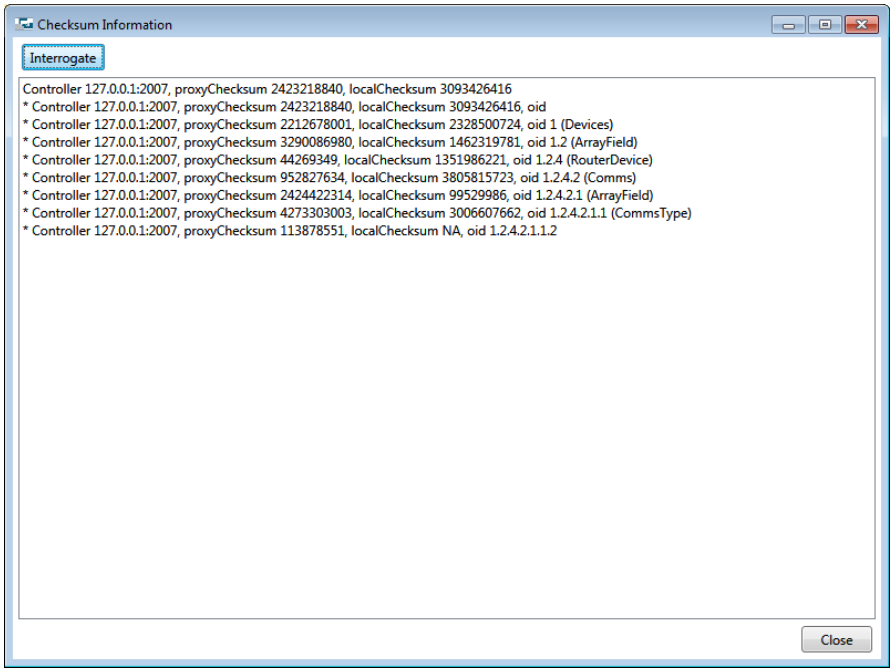
Checksum Information
Interrogate
Controller 127.0.0.1:2007, proxyChecksum 2423218840, localChecksum 3093426416
* Controller 127.0.0.1:2007, proxyChecksum 2423218840, localChecksum 3093426416, oid
* Controller 127.0.0.1:2007, proxyChecksum 2212678001, localChecksum 2328500724, oid 1 (Devices)
* Controller 127.0.0.1:2007, proxyChecksum 3290086980, localChecksum 1462319781, oid 1.2 (ArrayField)
* Controller 127.0.0.1:2007, proxyChecksum 44269349, localChecksum 1351986221, oid 1.2.4 (RouterDevice)
* Controller 127.0.0.1:2007, proxyChecksum 952827634, localChecksum 3805815723, oid 1.2.4.2 (Comms)
* Controller 127.0.0.1:2007, proxyChecksum 2424422314, localChecksum 99529986, oid 1.2.4.2.1 (ArrayField)
* Controller 127.0.0.1:2007, proxyChecksum 4273303003, localChecksum 3006607662, oid 1.2.4.2.1.1 (CommsType)
* Controller 127.0.0.1:2007, proxyChecksum 113878551, localChecksum NA, oid 1.2.4.2.1.1.2
Close

Fig 84. Checksum Information

This indicates if there is a difference between the controller configuration and the database configuration.

5.8.3.1 2450 Controller

For a 2450 controller the checksum is calculated using the configuration stored in the CompactFlash. The checksum is calculated at initial startup, and following a Push operation, when the new configuration is copied to the CompactFlash from RAM.

If using the Online Editor to make configuration changes, these will not affect the checksum. Such changes will be overwritten when the controller is rebooted, unless a Pull operation is performed to copy the configuration from the RAM to the CompactFlash.

See “Push and Pull Configuration” on page 97.

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5.8.3.2 246x Controllers

For 246x controllers, the checksum process is as follows:

- Workbench contains a copy of the configuration, which can be pushed to the controller, and Workbench generates a checksum against this.
- When a controller boots, it loads the pushed configuration and calculates its checksum against this, and caches the result. The cached checksum is returned to Workbench for it to generate the checksum indication.

  The controller then loads any values that are stored in the persistence file into RAM. Any changes based on this persistence data are not reflected in the checksum.

Persisted controller configuration parameters may be edited on the controller using the Generic Online Editor. Such edits are stored in the persistence file, and replicated to the second controller. These edits will NOT result in a checksum mismatch.

To integrate these edits into the Workbench copy of the configuration:

- Perform a Pull config from controller operation to load persistence data into the Workbench copy of the configuration, and then perform a Push operation to the controller to make the checksums match. See “Push and Pull Configuration” on page 97.

5.9 Controller Management

5.9.1 Edit Controller IP Address or Name

The controller settings dialog box displays the Type, Name, IP Address and the Port for the controller, see Fig 85.

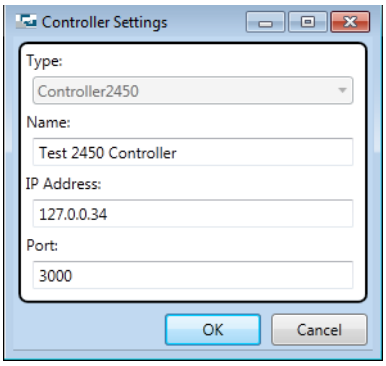

Fig 85. Controller Settings

Note: The controller type cannot be changed.

To change the basic settings of an existing controller:

1. In the Configuration window, select the controller and click the **Edit IP Address or Name** button. The Controller Settings dialog box displays.
2. Make the required changes to the Name, IP Address, or Port.
3. If any rules reference the controller these can be updated.
4. Click **OK**.

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5.9.2 Push and Pull Configuration

The **Push Config to Controller(s)** and **Pull Config from Controller(s)** buttons are for uploading and downloading configurations to and from the controller. The first time a controller is run, it is necessary to push from the database to the controller.

When connecting to an existing controller, pull from the controller ensuring that a known working configuration is used. Pushing to the controller can result in lost data.

Pushing a configuration causes the controller to display the green tick to show the configuration matches. However, on 2450 controllers, the controller does not take action on the new configuration until it is reset. To reset the 2450 controller, click the button.

Note: As changes to configuration affects both the controller any connected clients (LiveRunner and other controllers connected via DCCP), it is recommended that these are closed for the duration of the push, and restarted afterwards.

In a dual controller configuration, the following configuration update procedure is recommended:

1. Close all connected clients.
2. Push the new configuration to the Standby controller and wait for it to restart.
3. Force a reset of the Active controller. This will initiate a fail-over to the Standby controller, which now has the updated configuration.
4. Wait for the restarted controller to boot (now as the Standby controller) and push the new configuration to it.
5. Force a reset of the Standby controller to activate the new configuration.
6. Restart the clients closed previously.

Push and pull configurations to part of the database through the Online Editor. See “Online Editor” on page 95.

Note: Controllers can be configured to restart automatically after a full database push. This is set in the Generic Editor for 2330/246x/PC controllers. See “Generic Editor” on page 94. For 2450 controllers, this is set in the config.ini file. See “Configuration Initialization File” on page 197.

5.9.2.1 Push Failure

If there is a problem pushing as part of the upgrading procedure, remove the .dccp_config file from the controller (located in the same folder as the controller .exe file), then push the configuration.

If the controller is not present or has crashed, when pushing from Workbench, a “Failed to connect” message displays after ten seconds.

If there are problems connecting, the “Failed to push configuration” message displays. This may be because the configuration is too large and causes a time-out over the DCCP connection. To stop this from happening, edit the Workbench shortcut so that it increases the DCCP time-out:

1. Right-click on the shortcut and select properties.
2. Add “-dccpTimeout X” to the end of the shortcut, where X is a time-out value in milliseconds. If the time-out value is already present, increase the time-out value.
3. Click **OK**.

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5.9.3 Configuration Backup

Configuration files may be exported or imported either singly, or all at the same time, to a file. Individual files are stored as .DCCP files, and all files are stored as .zip files.

Configurations should be backed up before editing or deleting a controller.

For a full backup use SQL Management Studio, see Appendix F.

5.9.4 Reset

This is the equivalent of pressing the Reset button on the front of the controller. For a 2450 controller, it is necessary to reset the controller after pushing or pulling a configuration.

5.9.5 Dual Redundancy

Note: Dual redundancy only applies to hardware controllers. Both controllers must be connected to the network.

Dual redundancy is a method of pairing controllers so that in the event of a failure of one controller, the other will immediately take over operations. It also provides a way of testing any changes without interrupting operations by pushing a new configuration to the Standby controller, test the changes, and either revert to a previous state or update the Active controller.

Any two hardware controllers of the same type can be paired.

Note: The configuration information is not shared between controllers. To make controllers identical, select the controller to copy the configuration from and click the **Copy config to partner** button.

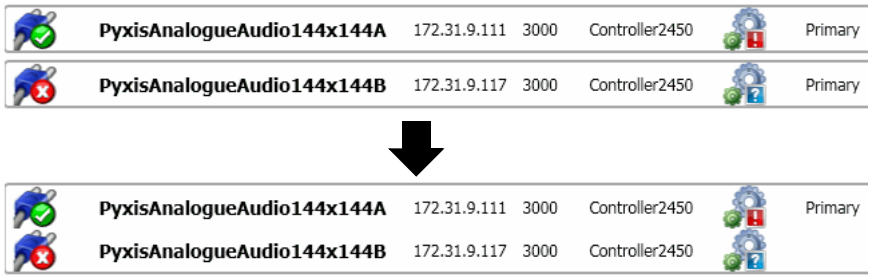
PyxisAnalogueAudio144x144A 172.31.9.111 3000 Controller2450 Primary
PyxisAnalogueAudio144x144B 172.31.9.117 3000 Controller2450 Primary
PyxisAnalogueAudio144x144A 172.31.9.111 3000 Controller2450 Primary
PyxisAnalogueAudio144x144B 172.31.9.117 3000 Controller2450

Fig 86. Dual Redundancy

To pair two controllers:

1. Select two controllers of the same type.
2. Click the **Pair Controllers** button. The first controller shows that it is the Primary controller. Workbench indicates that there is a difference between partners.

Important: The **Primary** controller is the one that the hardware and software panels make reference to in Design mode. It does **not** refer to the physical hardware, or which controller is in operation.

To unpair two controllers:

1. Select the two paired controllers.
2. Click the **Unpair Controllers** button.

   The two controllers split to become individual controllers.

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5.9.5.1 Copy Config to Partner

This copies the configuration from the selected controller to the paired controller, the status shows that both controllers are synchronised. This is particularly useful when installing a replacement controller card, for example, to copy the current configuration to the new controller.

5.9.5.2 Swap Controllers

This swaps the Primary controller with the Secondary controller.

After swapping the controllers, push the configuration to the new Primary controller.

Important: Swapping controllers loses the behavior for any hardware or software panels that references the Primary controller. Reconfigure the panels to reference the new Primary controller.

5.9.5.3 Auto-Changeover

Controllers can also be set to switch operation from the Active controller to the Standby controller in the event of a network failure.

Note: The changeover occurs only if the Standby controller has a working network connection.

For 2450 controllers, this feature is set using the Generic Editor. See “Generic Editor” on page 94.

1. Expand the Controller node.
2. Expand the Config2450 node.
3. Expand the Features node.
4. Edit the AutoChangeOverIfNoNetwork giving a time (in seconds), for which the network has failed before performing the changeover to the Standby controller.

   A time of -1 disables this feature.

For 246x controllers, this feature is set using the Online Editor. See “Online Editor” on page 95.

1. Expand the Controller node.
2. Expand the ConfigurationItems node
3. Expand the MiscellaneousFeatures node.
4. Edit the AutoChangeOverIfNoNetwork giving a time (in seconds), for which the network has failed before performing the changeover to the Standby controller.

   A time of -1 disables this feature.

Note: The AutoChangeOverIfNoNetwork feature under the Features node has no effect.

5.9.6 Refresh

This refreshes the list view of the controllers.

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5.9.7 Advanced

The Advanced section has three buttons:

- Connections, see section 5.9.7.1.
- OID Rewrite Helper, see section 5.9.7.2.
- Snapshot Editor, see section 5.9.7.3.
- Delete RollCall Cache.

5.9.7.1 Connections

This lists the controllers in a pop-up window indicating the active connections.

5.9.7.2 OID Rewrite Helper

Important: Back up the database before changing any OID values, see Appendix F.

Each physical entry in a controller's database has an **OID** address (Object Identifier). For example, the address value for a specific control such as the router source for a destination.

The OID Rewrite Helper provides a method to globally change any DCCP reference so that it points to a new OID address, see Fig 87.

Note: The OID Rewrite Helper does not change the values of the referenced OID address.

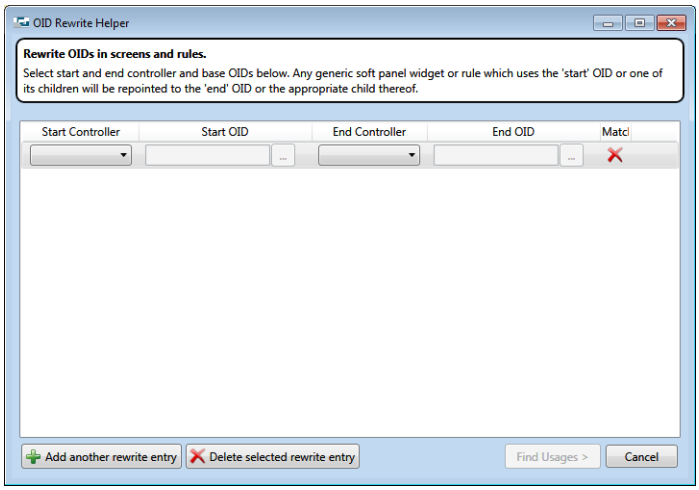
OID Rewrite Helper
Rewrite OIDs in screens and rules.
Select start and end controller and base OIDs below. Any generic soft panel widget or rule which uses the 'start' OID or one of its children will be repointed to the 'end' OID or the appropriate child thereof.
Start Controller
Start OID
End Controller
End OID
Matc
Add another rewrite entry
Delete selected rewrite entry
Find Usages >
Cancel

Fig 87. OID Rewrite Helper

To change the OID References:

1. For each rewrite entry, select the **Start Controller** from the drop-down list.
2. Select the **Start OID** address. Either type or paste the OID value, or click the ... button to open the Choose DCCP Field browser. Valid OID values are colored green. Invalid OID values are colored red.
3. Select the **End Controller** from the drop-down list.
4. Select the **End OID** address. Either type or paste the OID value, or click the ... button to open the Choose DCCP Field browser. Valid OID values are colored green. Invalid OID values are colored red.

   If the **Start** and **End** OID addresses match, the match icon changes from ✗ to ✓.

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5. If the entries match, click the **Find Usages** button. A list of all occurrences displays.

6. To globally change all the OID references, click the **Rewrite OIDs** button.

5.9.7.3 Snapshot Editor

The Snapshot Editor allows all (or a selection of) crosspoints from each controller on the live system to be saved, for restoring at a later time. Also, saved snapshot files (.csv) can be edited.

1. Click **Snapshot Editor...**

   The Snapshot Editor window displays.

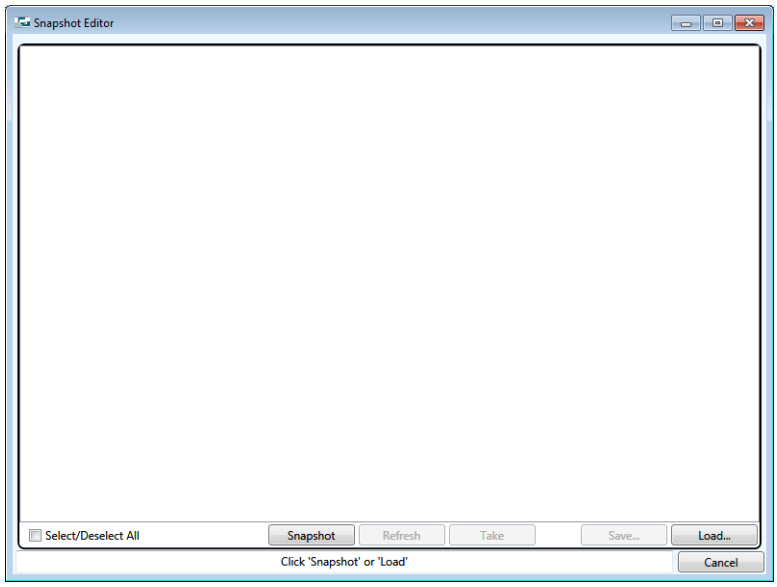

Fig 88. Snapshot Editor

2. Click on the **Snapshot** button.

   All current crosspoints for each controller display.

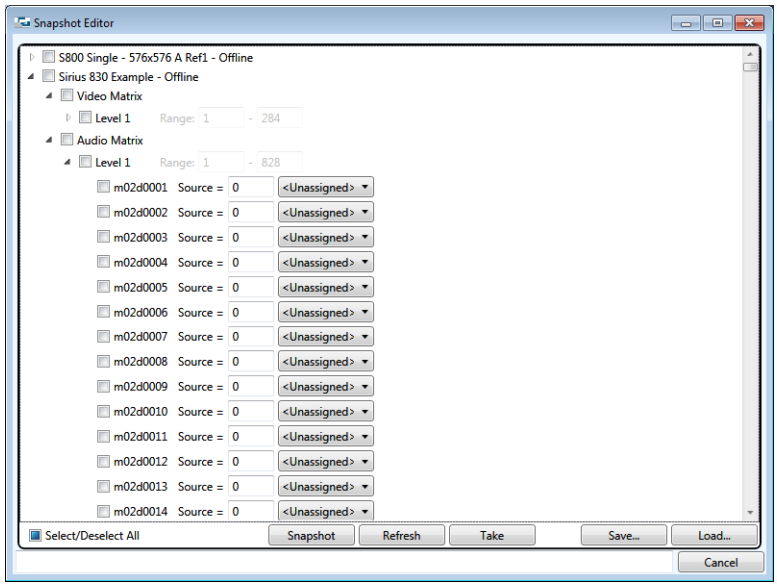

Fig 89. Snapshot Editor Showing Crosspoints

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Controllers that are not currently connected/online have " - Offline" appended to the controller name in the display.

Note: Any of the crosspoints may be edited at any time within the Snapshot Editor window.

Selecting Crosspoints

- Click ▷ to open a controller, and subsequently the matrices and levels below each, to view individual destinations (and currently routed source).
- Click ▲ at each level to close the levels, matrices and controller. Clicking ▲ at the controller level closes everything below that controller.
- Toggle the checkboxes, as required, to select/deselect individual or groups of crosspoints. At the bottom left of the window is a checkbox for selecting and deselecting all crosspoints.

  To select a block of crosspoints on a particular controller, enter start and end values in the Range boxes.

Saving a Snapshot

- To save the current router crosspoints as a snapshot file, click **Save**.

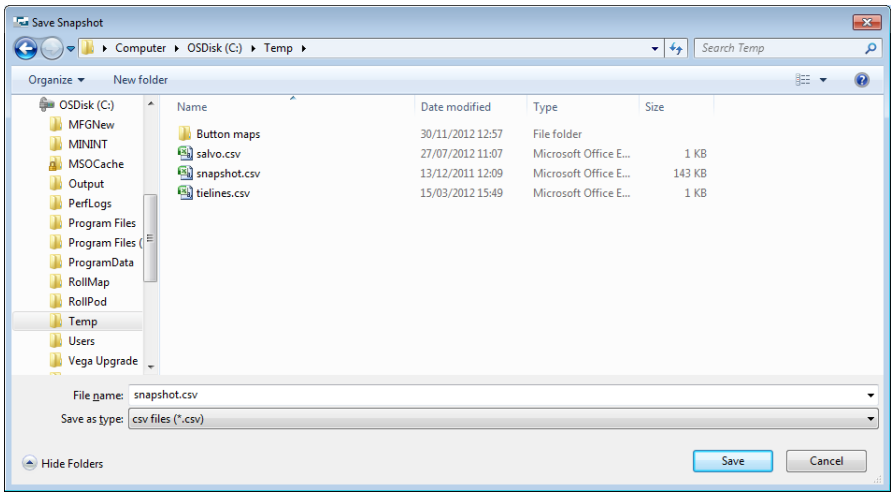

Fig 90. Save Snapshot File

In the dialog box that displays, browse to the location for the file to be saved, enter a filename, and click **Save**.

Once the file is saved a dialog box displays indicating the number of crosspoints saved.

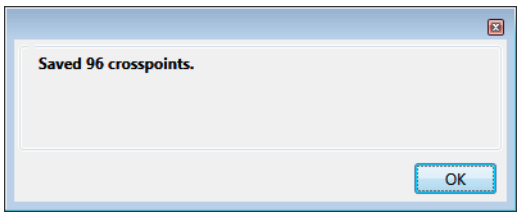

Fig 91. Crosspoints Saved

- Click **OK** to close this dialog box.

  The snapshot is saved as a .csv file. The contents of the snapshot file may be edited using an external editor, for example, Microsoft Excel.

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Loading a Snapshot

- Click **Load** to load a previously saved snapshot:

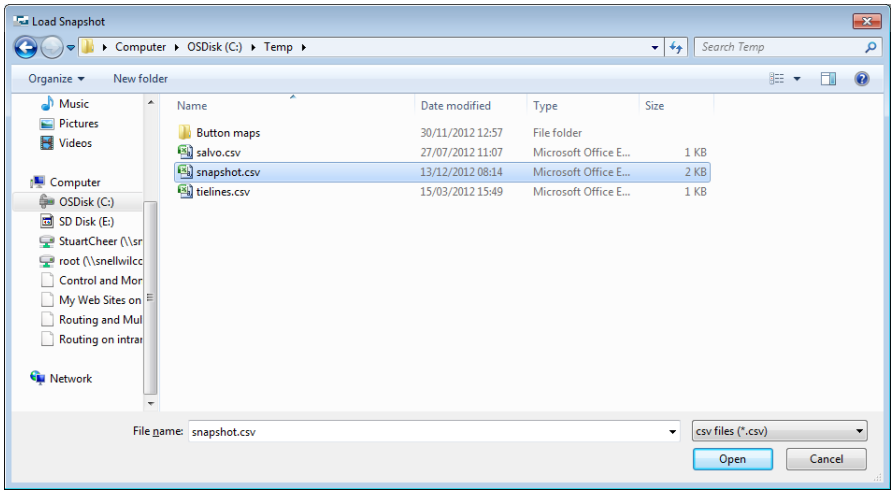

Fig 92. Load Snapshot File

In the dialog box that displays, browse to the location where the snapshot files are saved, select the file, and click **Load**.

The snapshot is loaded and the screen displays all of the crosspoints that are available in that snapshot file. Offline crosspoints are shown.

The following options are available:

- Edit crosspoints and re-save the snapshot file, or save as a new snapshot. See “Saving a Snapshot” on page 102.
- Take the selected crosspoints. See “Take” on page 103.

Take

Take sets the crosspoints on the live system to those that are currently selected in the Snapshot Editor. Unselected crosspoints are not Taken.

- Click **Take**.

  A dialog box displays asking for confirmation of the Take.

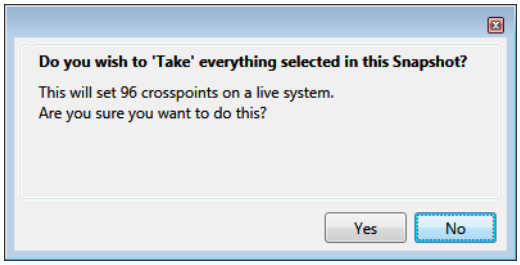
Do you wish to 'Take' everything selected in this Snapshot?
This will set 96 crosspoints on a live system.
Are you sure you want to do this?
Yes
No

Fig 93. Take Confirmation

- Click **Yes**.

  A further dialog box displays indicating the number of crosspoints that have been set.

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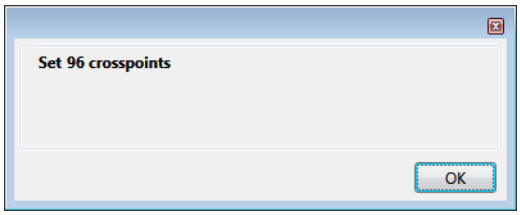

Fig 94. Crosspoints Set

- Click **OK**.

  Offline routers are ignored, and any routed sources set to zero are not affected.

Load All

- Click **Load All** to take a brand new snapshot of the live system containing all controllers.

  A confirmation dialog box displays. Click **Yes**.

Note: Any current selections or crosspoint values made in the Snapshot Editor remain.

Refresh

- Click **Refresh** to update the current snapshot with the crosspoints from the live system.

  This will overwrite any current edited or loaded crosspoints. Offline routers will have their routed sources set to zero.

  Controllers on the live system that are not in the snapshot are not loaded.

Note: Any current selections made in the Snapshot Editor remain.

5.9.8 Delete RollCall Cache

To clear the cache of RollCall menu set data (the menu screens loaded when adding a new or updated module):

1. Click on the **Delete RollCall Cache** button.
2. A confirmation screen displays. Click **OK**.

5.9.9 Convert a Nucleus 2450 Controller to a 246x Controller

When replacing Nucleus 2450 controllers with 246x controllers, there is no need to delete the original controllers and configure new ones.

- In configuration mode, right-click on the Nucleus 2450 controller, and select **Convert to 246x**.

  This runs a wizard configuring the 246x controller and updating any screens connected to that controller. In the case of dual controllers, the conversion need only be performed on the Primary controller, as the wizard will convert both.

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5.9.10 Upgrading

When Workbench is upgraded, it is recommended that PC controllers also be upgraded.

5.9.10.1 PC-based Controllers

1. Copy the ‘CentraController.exe’ file and overwrite the existing controllers.
2. Delete the ‘CentraController.dccp_config’ files that are in the controller’s folders (the config files are unlikely to work across versions and may even crash the controllers).
3. Restart the controllers.
4. Push their configurations, see section 5.9.2.

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6. Design Mode

6.1 Description

Design mode allows the creation of new soft panels, and editing of hardware and soft panels.

To open design mode, log in as a user with Design permissions, see section 4.3.

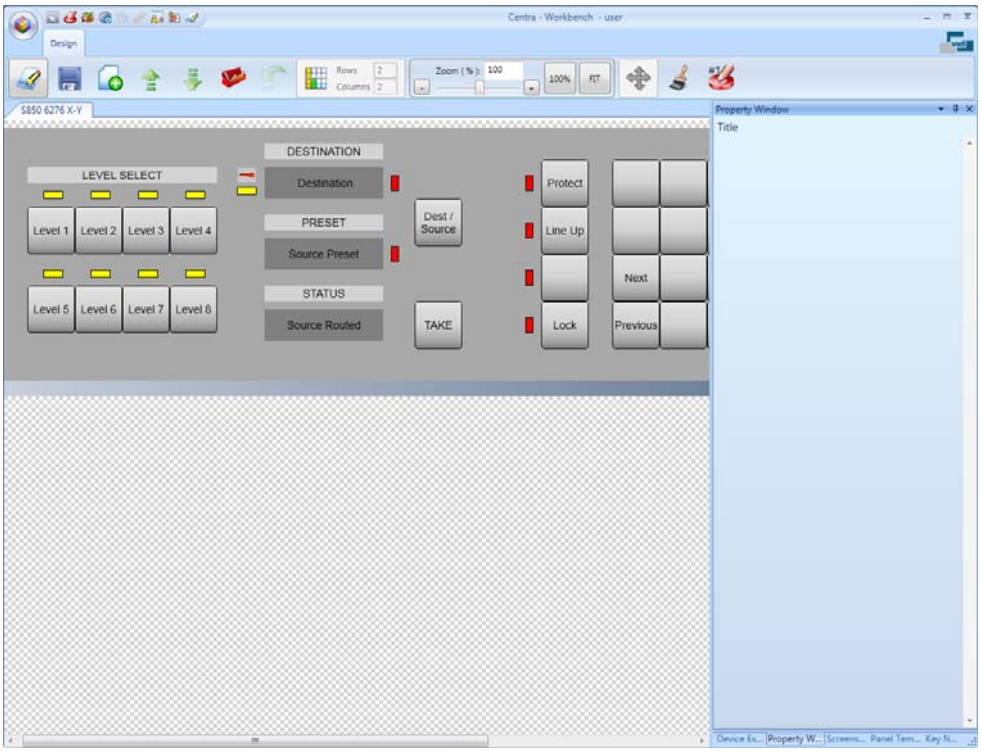

Fig 95. Design Mode

Note: By default, the first time the Design window opens, the first screen in the Screens Editor tab is shown. Subsequently, the design view displays with the default initial screen, see section 4.2.

6.2 Toolbar

The toolbar buttons are listed in Table 29.:

Button	Description
	Edit: Toggle the edit mode of the screen.
	Save: Saves the changes to the current screen.
	New Screen: Opens the new screen wizard, allowing creation of a new blank screen, customized video XY routing screen, or customized audio XY routing screen, see section 6.4
	Export: Exports the screen to transportable XML, see section 6.4.3
	Import: Imports a screen from transportable XML, see section 6.4.3

Table 29. Toolbar Buttons

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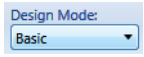
Button	Description
	Screens: Lists the screens available as tabbed windows at the right-hand side of the design area: • Device Explorer, see section 6.9 • Property Window, see section 6.8 • Screens Editor, see section 6.4.2 • Panel Templates, see section 6.5.3 • Key Names, see section 6.10 • Sequences Editor, see section 6.11 • Toolbox (only available in edit mode), see section 6.7 Click on a screen to open that tabbed window. Alternatively, click on the relevant window tab.
	Undo (Ctrl+Z)
	Create Grid: Creates a grid of controls, for example a button keypad. see section A.1.1.5 All of the items in the Toolbox can be placed individually or in a grid array.
	Zoom: Adjusts the magnification view of the screen. FIT positions and sizes the whole screen to display within the design window.
	Placement Lock: Locks the contents of the screen so that panels, buttons etc. cannot be moved. Items can still be selected for editing as normal.
	Brush: Displays the Brush Repository, see section 6.13.
	Run Screen: When not in edit mode, test the current screen by clicking the Run Screen button. Note: This works differently to the Run button in the main menu, as it ignores any screen link buttons.
	Design Mode: Select Basic or Advanced mode from the drop-down list. Advanced mode displays extra tools in the Tool Box, and additional properties in the Property Window.

Table 29. Toolbar Buttons

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6.3 Menu

When in edit mode, a right-clicking the main design area of the displays an editing menu:

Delete	Deletes the current selection
Cut	Cuts the current selection
Copy	Copies the current selection
Paste	Pastes the last item cut or copied into the current location
Paste Special...	Paste all widgets into the current Group
Key Sequences	Opens the Key Sequences Editor. See “Key Sequences” on page 121.
Maximise Panel	Enlarge the panel to the full size of the Screen. See “Screens” on page 108.
Auto Edit	Opens the Auto Edit dialog box. See “Auto Edit” on page 124.
Add Tab Page	Adds a new tab (when a tab is selected)
Remove Tab Page	Removes the current tab (when a tab is selected)
Create Template	Add a new panel template (when a panel is selected)
Send to Back	Move the current selection to the back of the screen
Send Backwards	Move the current selection one step backwards to behind the next most forward item
Bring to Front	Move the current selection to the front of the screen
Bring Forwards	Move the current selection one step forwards to in front of the next most forward item
Properties	Opens the Property window for the current selection
Screen Properties	Opens the Property window for the Screen
Group Properties	Opens the Property window for the Group

6.4 Screens

A screen is a container for one or more panels. Each screen must have at least one Soft Panel or Hardware Panel, see section 6.5.

The Worked Examples provide guidelines. See Appendix A.

To create a new screen, select one of the following:

- Create a new blank screen, and add panels and controls from the toolbar, see section 6.4.1.
- Select a panel from the **Screens Editor** tab, make a clone of it, and configure the new version as required, see section 6.4.2.

Note: The screens listed in the Screens Editor tab are part of the “Example Resources” option of the Workbench installation.

- Create a new Hardware Panel through the **Add Hardware Panels Wizard**. The wizard has the advantage that many of the parameters are configured for the controller, see section 5.6.1.
- Import an existing screen and configure it as required, see section 6.4.3.
- Screens can be grouped together in folders. Right-click on the Screens Folder, and click on the **New Folder** from the menu. Click on the folder name to rename it.

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6.4.1 Create a New Blank Screen

To create a new blank screen:

1. At the bottom-right of the window, select the **Screens Editor** tab, see section 6.4.2.
2. Either on the **Screens Editor** tab click the **Add** button, or on the toolbar click the button.

   The **New Screen** wizard displays.
3. Type a name for the new screen.
4. From the drop-down list select the type of screen to create:

   - **Blank**—build up a screen with as many panels as required for any number of different tasks are necessary.
   - **Basic Routing**—a video XY routing panel template that can be edited, as required.
   - **Audio Track Routing**—an audio XY routing panel template that can be edited, as required.

   If a Blank screen is selected, click **Finish**. The screen displays, and is ready for editing.

   If a Video or Audio screen is selected, click **Next**.
5. Select a screen size and select a color theme from the drop-down lists.
6. Click **Next**.
7. Select a controller and matrix from the drop-down lists.
8. Click **Finish**. The screen displays, and can be edited, as required.

Note: To open any screen in the list, double-click on the thumbnail. Only one screen can open at a time.

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6.4.2 Screens Editor

The Screens Editor displays the screens available on the system, including Soft screens and Hardware screen templates.

To open the Screens Editor:

- Click on the **Screens Editor** tab.

  The Screens Editor window displays.

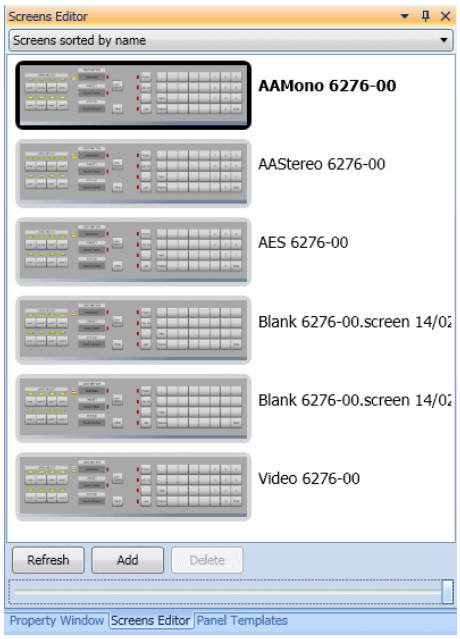

Fig 96. Screens Editor

Note: The slider at the bottom of the window resizes the view of the screens in the Screens Editor.

The screens can be displayed in alphabetical order (default) or by alias (see section 6.4.2.1), selectable from the drop-down list at the top of the Screens Editor.

Right-clicking on a screen in the Screens Editor displays the following menu:

Edit Alias	Edit the alias number of the screen, see section 6.4.2.1
Clone Screen	Make a copy of the screen. A prompt for a new name displays.
Run Screen	Runs the screen. Screen link buttons are ignored.
Set as start screen	Sets the selected screen as the initial screen for the current user. See “Users” on page 36.
Delete Screen	Deletes the screen from the Screen Editor.

To rename a screen:

- Click on the screen title.
- Edit the title, as required.

Note: After renaming a screen, to display the screens in the correct alphabetical order, select Screens sorted by alias from the drop-down list at the top of the screen, then re-select Screens sorted by name.

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6.4.2.1 Screen Alias

The screen alias is a number attributed to a screen to allow the screen to be referenced by that number. This is particularly useful when a screen is linked by another screen. If the alias number is used then any subsequent changes to the screen name will not inadvertently break the link between the screens.

By default all screens have an alias of zero; no alias. A zero alias is not indicated on the display.

To add an alias:

1. Right-click on a screen in the Screens Editor, and click **Edit Alias**.
2. Enter an alias number and click **OK**.

   The alias number displays under the screen name in the Screens Editor.

6.4.3 Screen Templates

Several screen templates are included with Workbench. By default, panel templates are located in the Workbench installation folder, under:

...\Workbench\Screens\Hardware Panels

...\Workbench\Screens\Vistek

Screens are also made available to customers who have purchased Snell products such as hardware control panels and modular screens. These screen templates can be imported to Workbench, greatly reducing the amount of time required to build screens. Screens can also be found through the Snell Web site.

To import a screen template:

1. From the toolbar, click the button.
2. In the dialog box that displays, navigate to the template file.
3. Click **Open**.

   If the screen is to be assigned to a different system, assign the relevant Group. See “Groups” on page 114.

To export a screen template:

1. From the toolbar, click the button.
2. In the dialog box that displays, select a location for the file to be saved, and change the name of the file if required.
3. Click **Save**.

Note: Backup and restore screens from **Administration | Data Management**, see section 4.7.

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6.5 Panels

A panel can have any number of groups and controls. A panel can be either a Soft Panel, or a Hardware Panel.

Edit the position, size, style, and behaviors of panels using the Properties Window. See “Property Window” on page 119.

6.5.1 Hardware Panels

A Hardware Panel is a screen template of a physical hardware device, for example, a control panel. The position of the buttons and other controls closely resemble the positions on the physical hardware. The hardware panel is configured on-screen which in turn sets up the operation of the connected control panel.

To add, edit and configure Hardware Panels, see “Panel Device” on page 81.

6.5.2 Soft Panels

A soft panel can be configured to be anything related to the control and monitoring of the system, and can be designed as simply or intricately as desired, with relevant controls arranged into Groups, each with specific behaviors. See “Groups” on page 114.

6.5.3 Panel Templates

Any panel can be exported as a template.

To view existing templates:

- Select the **Panel Templates** tab, see Fig 97.

Panels created using a template are linked to the template so that any changes in properties are reflected through all panels created using that template.

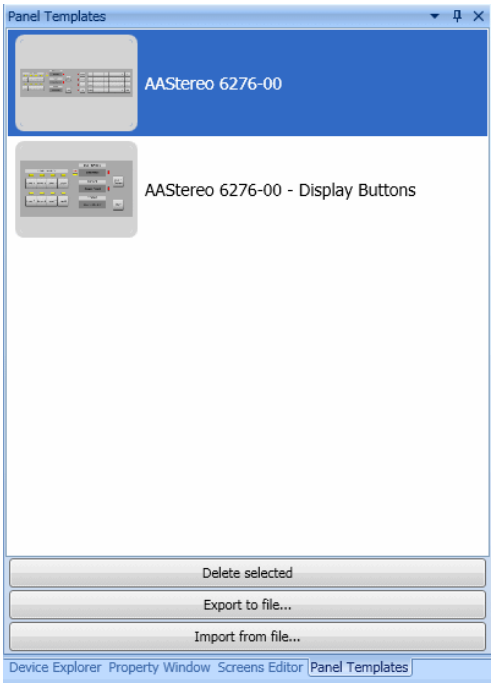

Fig 97. Panel Templates

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To create a new panel template:

1. Open the required panel from the Screens Editor tab.
2. Click the button to edit the panel. The **Toolbox** displays at the bottom of the window.
3. Right-click on the panel and select **Create Template**. The panel is added to the Panel Templates tab, with a default name of New Template.
4. Click on the Panel Templates tab.
5. Click on the new panel template title, and rename the panel template.

6.5.3.1 Use Panel Templates

To use a panel template:

- Double-click on the panel template from the list and click onto the screen. Repeat the process to add further panels on the screen.

  Any number of panel templates may be added to a screen.

Changing a property of the panel causes all the panels linked to the template to change their property at the same time. For example, changing the color of a button background on a panel causes the same button background to change on all panels.

Any changes made to the panels are reflected back to the template, and the template is updated at the same time.

The properties of a panel can be changed without changing the template. See “Override Panels” on page 113.

6.5.3.2 Override Panels

A panel created from the panel template can be edited without affecting the template, by overriding it to change the properties required.

When in override mode, it is not possible to make changes to other panels. Also, it is not possible to add or remove groups, tabs or controls on the selected panel, in override mode.

To override a panel:

- Right-click on the panel, and from the menu click on **Override Panel**.

  Any changes made during the override are not reflected on the other panels, nor is the template updated.

Note: Changing a property on a panel in override mode affects only that particular property, and other properties remain as per the template. For example, changing a button color only in override mode, then changing the size of that button on the template, results in the button with the override on the color still changing size accordingly with the template.

To return to editing all panels:

- Right-click on the panel in override mode, and from the menu click on **Override Panel**.

  The panel is no longer in override mode and any editing of properties affects all panels.

Note: It is not possible to override the Behavior property of a group or control, or the Group property of a control.

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6.5.3.3 Detach a Panel

A panel can be detached from the template, so that any further changes to the template do not affect the panel, or vice versa.

To detach a panel:

- Right-click on a panel, and from the menu click on **Detach Panel**.

6.6 Groups

The group properties determine the behavior of all the controls within the group, and are specific to the device type or piece of equipment that the controls act upon. For example, in an alarm group, only the control behaviors appropriate for alarms are available.

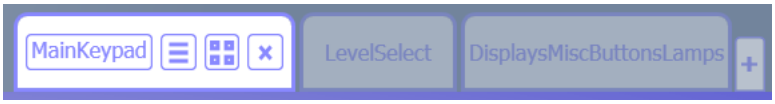

Fig 98. Group Tabs

Icon	Description
	Adds a new group
	Edit group name
	Open group properties
	Select all controls in group
	Delete the current group

Table 30. Group Buttons

Each screen can have numerous groups, and each group can have a different behavior type. Table 31. lists the available groups:

Group Name	Description
Alarm	Allows the alarms to trigger button states, and log to the screen. For example, setting alarms, acknowledgements and automatic resets.
Audio Path	Allows monitoring of the routes that individual audio channels take.
Audio Processing	For defining audio processing screens.
Audio Router XY Group	Controls for designing audio routing screens allowing groups of audio, for example, stereo pairs, to be routed and embedded onto a video stream for output.
Audio Router XY Track	Controls for designing audio routing screens allowing audio tracks to be routed and embedded onto a video stream on output.
Device Chain	Not for general use – used with mimic.
Generic	Allows control or status monitoring from any part of any device through the unique OID identifier. For use with drag and drop design. Note: For generic group behaviors it is possible to assign a property that may be inappropriate for a control.
Generic Dial Up	Allows for large sized routers to be controlled by a single panel.
Hardware Panel BPX	For configuring BPX hardware panels. Using the template in the Screen Editor is recommended.
Hardware Panel MultiBus	For configuring 6277 hardware panels. Using the template in the Screen Editor is recommended.

Table 31. Group Behaviors

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Group Name	Description
Hardware Panel XY	For configuring XY hardware panels. Using the template in the Screen Editor is recommended.
Hardware Panel XY6276	For configuring 6276 hardware panels. Using the template in the Screen Editor is recommended.
Mimic	Allows for mimic diagrams to work, requires system architecture configuration, see section 6.7.7.
Multi Bus	Allows selection of source then destination routing to single router (normal configuration is to set a destination and then source).
Multi Matrix BPX	Allows for selection of routes across tie-lines.
Multi Matrix Multi Bus	Allows selection of source then destination across tie-lines.
Multi Matrix XY	Allows for destination then source selection across tie-lines.
MultiViewer Device	Screen recalls and pushing.
Passive (default)	Used for text labels and other graphics when no other action is required.
Playout Device	Required for VTR / server control, play list display.
Router BPX	Allows selection of routes as a grid for single button per crosspoint to single router.
Router Dial Up	Allows for keypad dial-up for routing functions, source and destination keypads.
Router XY	Allows for destination then source selection on a single router.
Source Queue	For use with reverse mimic chain. Not for general use.
Tag Name Editing	Allows run mode editing of names without altering the configuration.

Table 31. Group Behaviors

The Group properties determine the behavior of the controls within the group. Add controls from the Toolbox to the Group, see “Toolbox” on page 115.

For details of the behaviors that can be allocated to each design control, see Appendix E.

6.7 Toolbox

The toolbox has groups of controls, each of which can be toggled open or closed by clicking on the Group Heading. Fig 99.

The Toolbox displays at the bottom of the screen when in edit mode. The available list of behaviors on a control depends on the type of controller selected in the group, and the behavior for the group it is in. For example, a button can be a destination for a router, or a play button for video server.

Edit the position, size, style, and behaviors of the tools using the Properties Window. See “Property Window” on page 119.

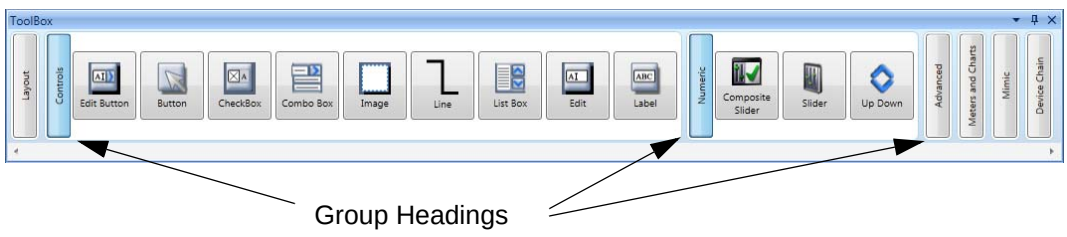

Fig 99. Toolbox Tabs and Controls

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6.7.1 Layout

A panel is a container for controls such as buttons, tallies, and so on. A screen must have at least one panel. The behavior can be either Soft Panel or Hardware Panel.

Panels can be imported from, and exported to a template, or added through the Add Panel Wizard.

When a panel is placed on a screen, it an be repositioned by clicking and dragging. The current position displays numerically at the bottom left of the panel during dragging.

A Tab control groups controls onto separate pages.

To add a tab page, right-click on the edge of the tab control and select **Add Tab Page**. All controls added to the tab page are only visible when the tab page is selected. To remove a tab page, right-click and select **Remove Tab Page**.

Groups: Each tab page can be assigned to a different Group, see section 6.6. All controls added to a tab page are automatically assigned to the same Group.

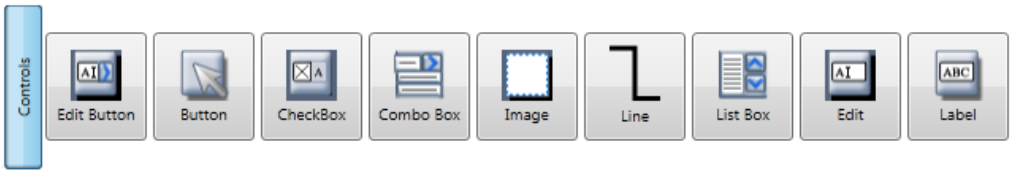
Tab Headers: In run mode, it is possible to either show the tab headers, or create separate buttons to select each tab page (Soft Panels only).

A Titled Box control is simply a black border that is placed around controls to show a visual grouping of controls, with an editable title to describe the contents.

Fig 100. Layout Panel Controls

6.7.2 Controls

If the Behavior of a control is set to DCCP, the value is set in the relevant property on the controller. All controls can tally back values too, in the form of text, slider, button colors.



Edit Button: Sets a DCCP text value. Only valid as DCCP behavior for the Generic and Generic Dial-up Groups.

Button: Performs a single action, generally setting a single value. For example, a BPX button, play on a video server, setting a single value to video gain.

CheckBox: A checkbox can have a state of True or False. Checked and unchecked values can be defined to give these results. Only valid as DCCP behavior for the Generic and Generic Dial-up Groups.

Combo Box: A Combo Box allows for selection of a value from a drop-down list.

Image: Adds an image stored in the Brush Repository, see section 6.13. Use to add a graphic to a button, a logo to a panel, or an image tally.

Table 32. Control Panel Controls

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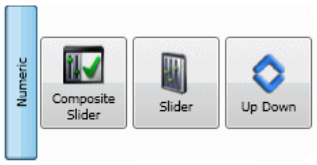
	Line: Adds a line. Initially the line is a diagonal. To reposition and resize the line drag the round nodes at each end of the line. To make complex lines, right click on the line, and select **Add Waypoint** to add a node in the line. Reposition the node to make an angle. Any number of waypoints may be added and moved in this way.
	List Box: Allows selection of a value from a static list. Long lists display a scroll bar for selection of a value not currently visible. For Router Devices, Source and Destination names (including their alternative “Tag” Names) can be changed while in Run mode, see section A.4.
	Text Edits: Directly type a value. For example, a tag name or a video server clip.
	Label: Displays any property value, or plain text. For example, can tally back on any routed source.

Table 32. Control Panel Controls

6.7.3 Numeric

For examples of how to use Numeric controls, see section A.5.



	Composite Control: A combination of slider, up, down and reset buttons, and an edit box in one control.
	Slider Control: A slider can set a DCCP value within a specified range.
	Up Down Control: Used to increment/decrement numeric property values.

Fig 101. Numeric Panel Controls

6.7.4 Advanced

	Hyperion Thumbnail: Connects to a Hyperion playing native Hyperion format video source.
	Jog Shuttle: This is a control that allows configuration of a jog shuttle pro button, but is not visible in run mode. Performs video server control in the same way as a normal button but via the external USB Shuttle Pro device.
	List Buttons: Automatically, displays all the possible options in a group of buttons. For example, all options for aspect ratio settings.
	Radio Buttons: Sets a DCCP field to the value of the selected radio button.
	Source Queue: Used in mimic systems to queue sources.

Fig 102. Advanced Panel Controls

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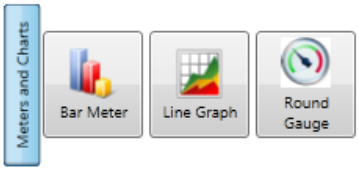
Media Player: Link to a video streaming service.

Web Browser: This control shows a selected web page.

Fig 102. Advanced Panel Controls

6.7.5 Meters and Charts



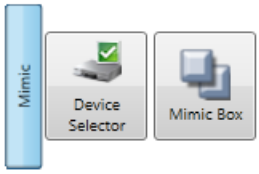
Bar Meter: A bar meter displays the current value of a DCCP property. Setup several meters alongside each other to provide a bar graph, for monitoring purposes, for example.

Line Graph: A line graph displays the value of a DCCP property as it changes over time.

Round Gauge: A “speedometer” type gauge that displays a DCCP property value.

Fig 103. Meters and Charts Controls

6.7.6 Mimic

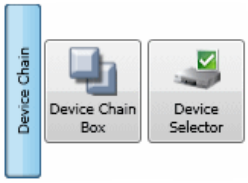


Device Selector: A block of buttons for setting the mimic mode.

Mimic Box: A target block for mimic panels.

Fig 104. Mimic Controls

6.7.7 Device Chain



Device Chain Box: A target block for mimic panels.

Device Selector: A block of buttons for setting the mimic mode.

Fig 105. Device Chain Controls

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6.8 Property Window

The majority of control configuration is done through the Property Window. For example, the dimensions of a Screen, the behavior of a Group, the position of a Panel, and all the colors, captions, and behaviors of all the different controls, including buttons, labels, etc.

To view or edit the properties of a control:

1. On the toolbar, click the button. The **Toolbox** displays at the bottom of the window.
2. At the bottom-right of the window, select the **Property Window** tab.
3. Select a control. The Property Window displays information that is relevant to the selected control, see Fig 106.

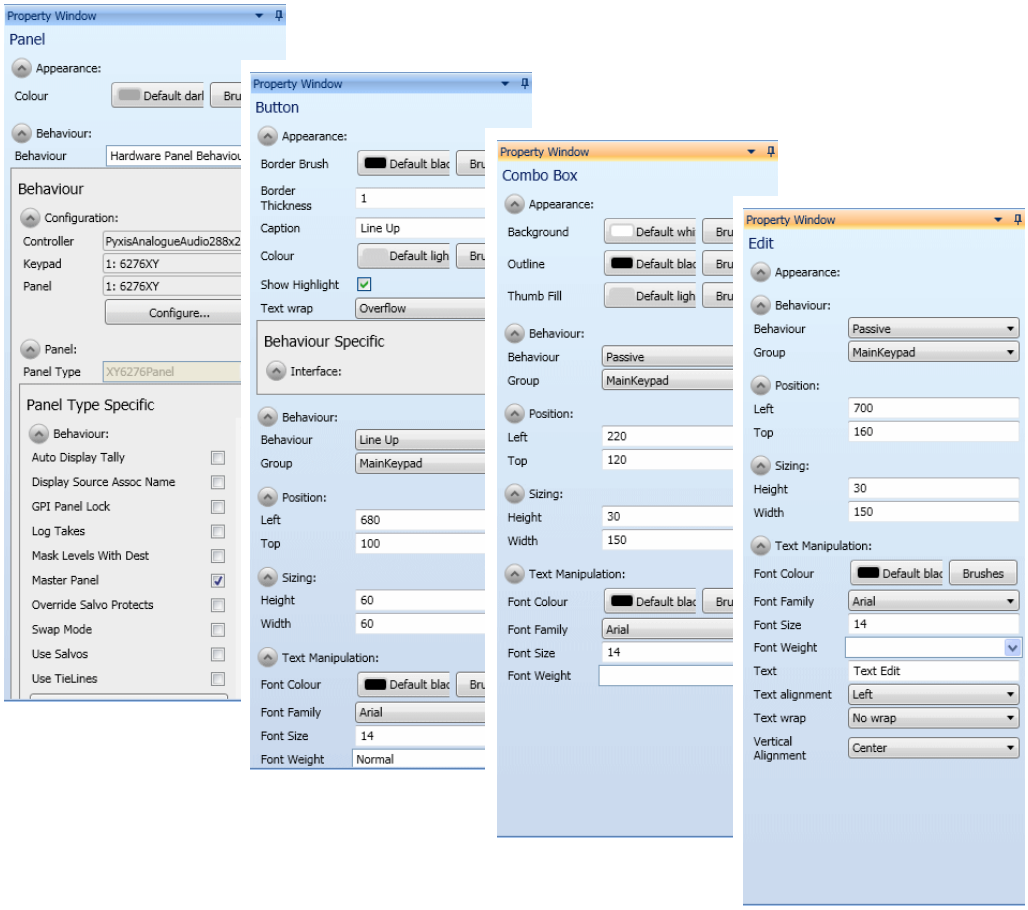

Fig 106. Property Window

The behaviors available for each individual control, such as a button, depend on the Group behavior. For example, if the Alarm behavior is selected for a Group then the behaviors available to the controls within that Group are only those relating to Alarms. For details about the behaviors available with each Group, see Appendix E.

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6.9 Device Explorer

The device explorer is used to view the DCCP values for all controllers and devices.

To view the properties of a device, at the bottom-right of the window, select the **Device Explorer** tab, see Fig 107.

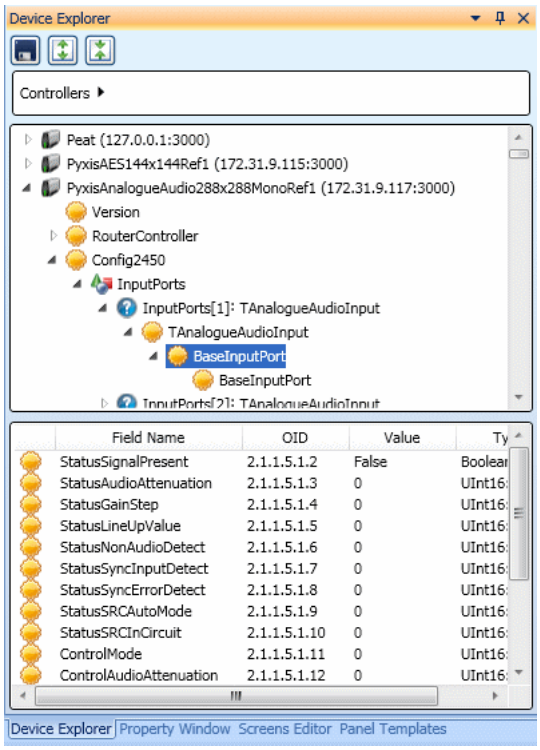

Fig 107. Device Explorer

6.9.1 DCCP Behavior

All controls that have the option for DCCP behaviors (depending on the Group behavior), can access the controller's configuration parameter.

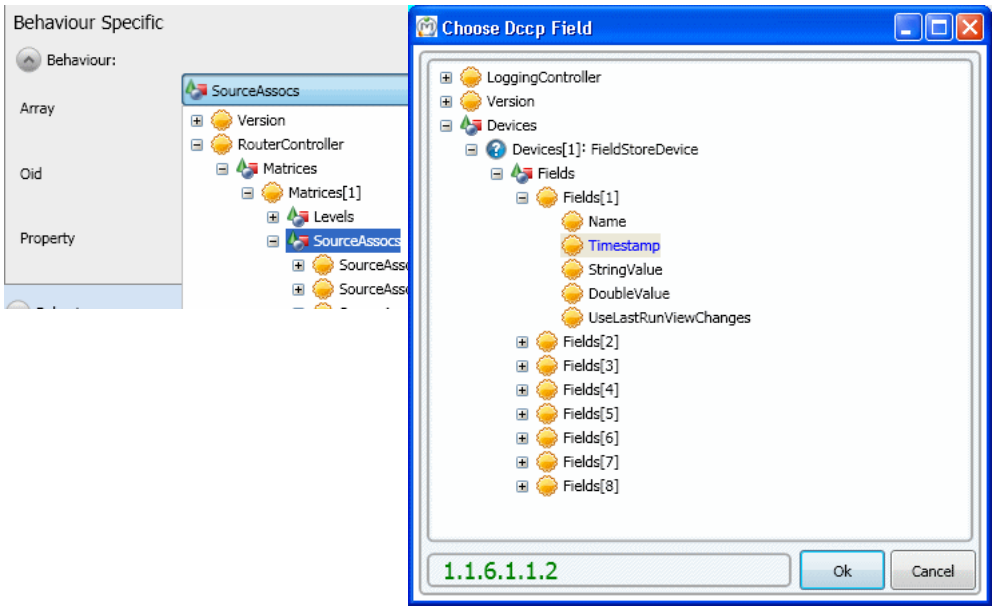

Fig 108. List Box - Array Selection

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Each entry in the controller's database has an **OID** address (Object Identifier). Navigate to the required OID either from the Behavior drop-down list, or click the ... button to open the **Choose Dccp Field** browser, see Fig 108. Valid OID values are colored green. Invalid OID values are colored red.

The OID can be dragged and dropped, or copied and pasted, to the relevant DCCP behavior of another control.

Note: It is possible to globally change the OID address for all Screen Objects and Rules through the Configuration, OID Rewriter Helper.

6.10 Key Names

Assign names/numbers to buttons, either using the pre-defined key names, or customized key names, as applicable.

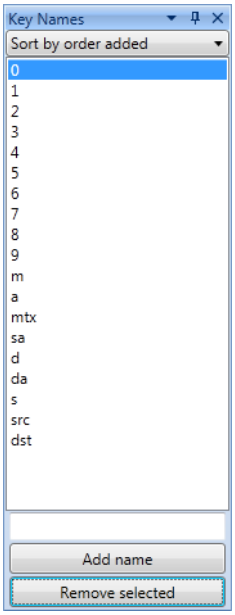

Fig 109. Key Names

To add a caption to a button:

- Drag a name or a number from the Key Names list to a button on a panel.

  The name or number is applied as a caption to the button.

To add a new name:

- Type a name in the text entry box, and click **Add name**.

  The new name is added to the Key Names list, for future use.

6.11 Key Sequences

6.11.1 Run Mode Key Sequences

Key sequences can be automatically set from a dial-up keypad in Run mode, negating the need to set them up in the first instance in the Key Sequences Editor.

To set run mode key sequences:

- In the Property window of a dial-up soft panel, check the Run Mode Auto Sequences checkbox in the Dial Up group behaviors.

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6.11.2 Key Sequences Editor

Buttons on a keypad group can be configured as dial-up sequences, which are stored in source and/or destination sequence sets. Sequence sets are only relevant for soft panels.

To open the Key Sequences Editor, do one of the following:

- Right-click on a panel and select **Key Sequences**.
- From the Property window of a dial-up group, click the **Key Sequences** button.
- Click on the **Key Sequences** tab, if it is currently docked, otherwise select it from the Screens menu item.

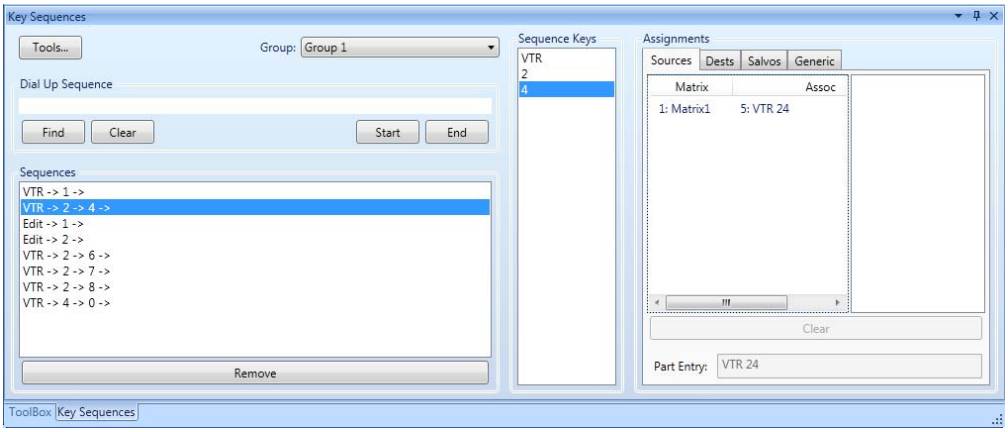

Fig 110. Key Sequences Editor

In Design Mode, when the Key Sequences Editor is first opened, the first dial-up group on the panel is automatically selected.

If there is more than one dial-up group on the panel, use the Group drop-down list to select the group for which key sequences need to be configured.

6.11.2.1 Automatic Key Sequences

1. In the Key Sequence Editor, select a group number from the Group drop-down list.
2. Click on the **Tools** button.

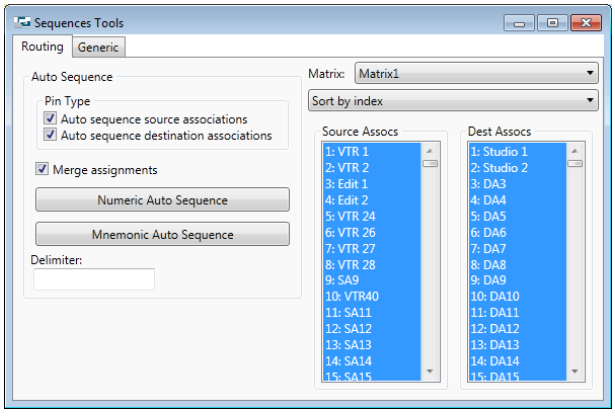

Fig 111. Sequence Tools

3. Check the Auto sequences checkboxes for source associations and destination associations, as required.

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To create Numeric sequences:

- Click on the **Numeric Auto Sequence** button.

  All possible sequences within the matrix are generated using the keypad numbers, for example:

  1 -> 0 -> 0
  1 -> 1 -> 0
  1 -> 1 -> 1
  2 -> 0 -> 0 etc.

To create Mnemonic sequences:

- Click on the **Mnemonic Auto Sequence** button.

  All possible sequences within the matrix are generated using the keypad numbers and named buttons, for example:

  VTR -> 1 -> 1
  VTR -> 2 -> 0
  VTR -> 2 -> 1
  EDIT -> 1 etc.

Sequences often contain more than one association, for example, VTR -> 2 -> 1 contains VTR 2 and VTR 21.

In this example the Sequence Keys field of the Key Sequences Editor displays the keys VTR, 2, and 1.

Selecting a key displays the association for that part of the sequence in the Assignments field of the Key Sequences Editor. For example, selecting the key 2 displays the association for VTR 2. Selecting the key 1, displays the association for VTR 21.

6.11.2.2 Manual Key Sequences

To set a manual key sequence:

1. In the Dial Up Sequence section of the Key Sequence Editor, click **Start**.
2. Click the buttons on the panel in the desired sequence. Each button press displays in the **Dial Up Sequence** box.
3. To finish entering the key sequence, click the **End** button. The sequence is added to the list shown in the **Sequences** box.
4. Select the sequence in the **Sequences** list.
5. Select a key press in the **Sequence Keys** list.
6. On the **Sources** tab, select a Matrix followed by an Association.

   The text that displays on the panel with each key press in the sequence displays in the Part Entry field. This text is automatically generated using the key names but can be changed if required.
7. Repeat this process until all the sequence keys have been assigned.
8. Click **Store** to save the key sequences.
9. Save and push the configuration to the controller.

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6.12 Auto Edit

6.12.1 Automatically Assign a Dial-up Keypad

To create a dial-up keypad:

1. Select, or add, a grid of 4x3 buttons.
2. Set the group behavior to Router Dial Up, or Generic Dial Up, and the button properties to Dial Up.

Note: Save the screen before applying a key assignment, as there is no undo available for Auto Edit.

3. With the buttons selected, right-click and select **Auto Edit...**
4. From the Helpers tab select Dial-up and the appropriate layout and click **OK**.

   Each button has its **Lower Text** behavior changed to the appropriate keypad number, see Fig 112.

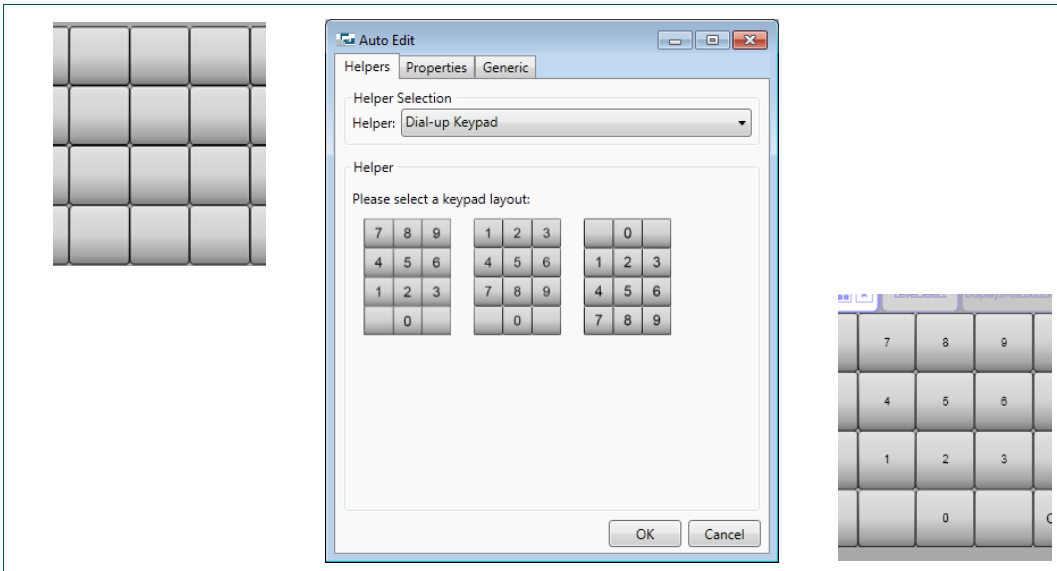

Fig 112. Automatic Keypad Dial-up

6.12.2 Automatic Key Assignment

Select a group of buttons and Workbench automatically assigns the correct source, destination, or BPX, to each button.

To auto-assign sources, destinations or BPX:

1. Open a screen created through the **Add Panel** wizard.
2. On the toolbar, click the button.

Note: Save the screen before applying a key assignment, as there is no undo available for Auto Edit.

3. Select the buttons to assign.
4. From the Properties Window, change the button's behavior to Source, or Destination, or BPX, according to the Group behavior and properties required.
5. With the buttons selected, right-click, and from the Helpers tab select Sources or Destinations or BPX.

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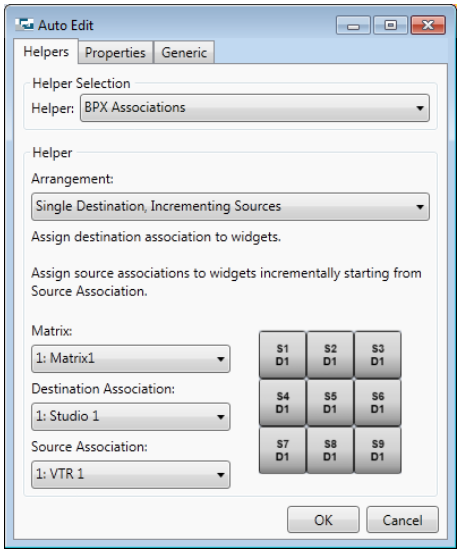

Fig 113. Automatic Key Assignment

6. Select **Matrix**, and **Association** from the drop-down lists and click **OK**.

   Each button is assigned a caption.

Note: To edit the button labels, select the buttons, and from the behavior section select the **Content Type** and **Destination Name Length**.

6.13 Brushes

The Brush Repository is used to create a palette of colors and images. Objects such as panels and buttons can be colored with a brush from the repository, and graphics or logos may be added to screens.

To open the Brush Repository, click the button. The Brush Repository is also available from the **Controller Configuration | Routers | Icons** section.

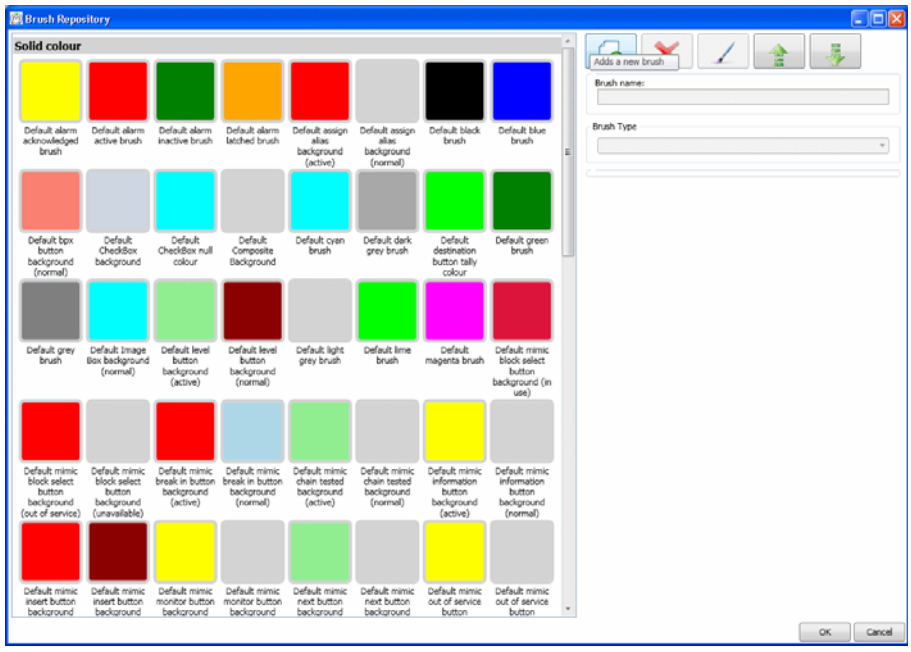

Fig 114. Brush Repository

Note: Images in Workbench have a name in the repository. Changing a brush, changes all occurrences of that brush.

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6.13.1 Add a Brush

To add a brush:

1. Click the button.
2. Rename the Brush.
3. From the drop-down list, select the **Brush Type**:
   - Linear Gradient
   - Solid Color
   - Radial Gradient
   - Image

6.13.2 Clone a Brush

A clone of a brush creates an identical copy of an existing brush. The copy can then be edited as required.

To clone a brush:

1. Select a brush.
2. Click the button. A copy of the brush is added to the repository named Brush 1.
3. Rename the Brush.
4. Edit the brush as required.

6.13.3 Solid Color

Solid colors use the standard RGB color model. Colors are created by mixing amounts of Red, Green, and Blue, see Fig 115.

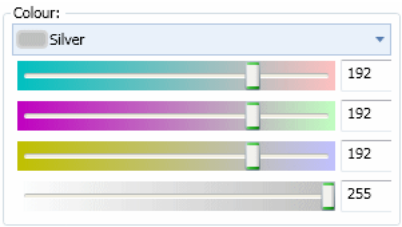

Fig 115. Solid Color Editor

Set each mixing color by either using the slider or, by directly entering a value from 0 to 255. When RGB=0, the color is black, and when RGB=255 the color is white.

The bottom slider sets the opacity level. With a value of 255 the color is opaque, with a value of 0 the color is transparent.

6.13.4 Linear and Radial Gradient

A Gradient fades one color into another. There are three attributes:

- A start color
- A finish color
- An offset: Sets the start position of the gradient from the edge of the brush.

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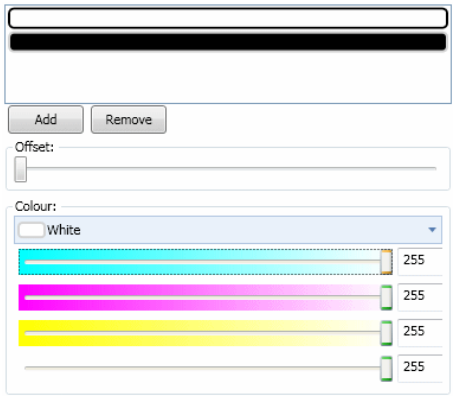

Fig 116. Gradient Editor

The default setting for the gradient is fade from one color to another. It is possible to set-up multiple fades by clicking the **Add** button. It is also possible to remove a fade by selecting it and clicking **Remove**.

6.13.5 Images

An image is stored in the Brush Repository and can be selected as a brush in the same way as choosing a color. Add the image to the Image Library before using it as a brush.

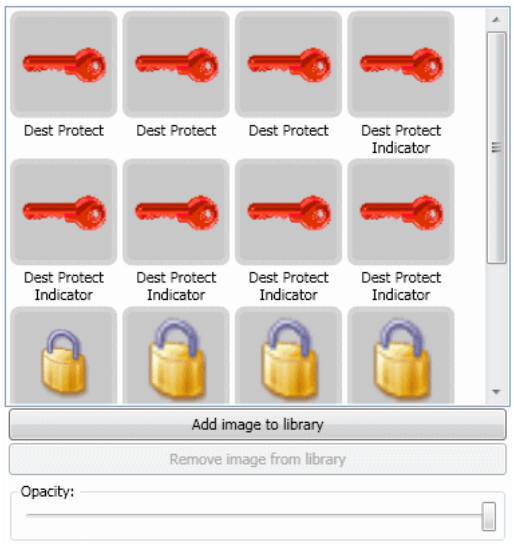

Fig 117. Image Editor

To add an image:

1. Click **Add new brush**. This creates an empty default brush.
2. To add a new image to the library; click **Add image to library**. This displays an **Add image** dialog box.
3. Navigate to the image, and click **OK**.
4. Select the empty default brush (or one to overwrite) and click on the new image.

6.13.6 Rename a Brush

To rename a brush, select the brush and type the new name in the **Brush Name** field.

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7. Rules

7.1 Description

Rules are a custom logical system that can help to automate tasks in Workbench. Rules take into consideration all the criteria that are set in the rules editor, and return a single boolean output of TRUE or FALSE. One or more Actions can be set to occur as soon as the conditions for the Rule are fulfilled.

To open Rules, log in as a user with Rules permissions, see section 4.3. It is available from the Windows Start Menu:

Note: Rearrange the Rules Editor, Property Editor and Actions in the Design View so that they are open at the same time, see Fig 118. and “Mode Windows” on page 33.

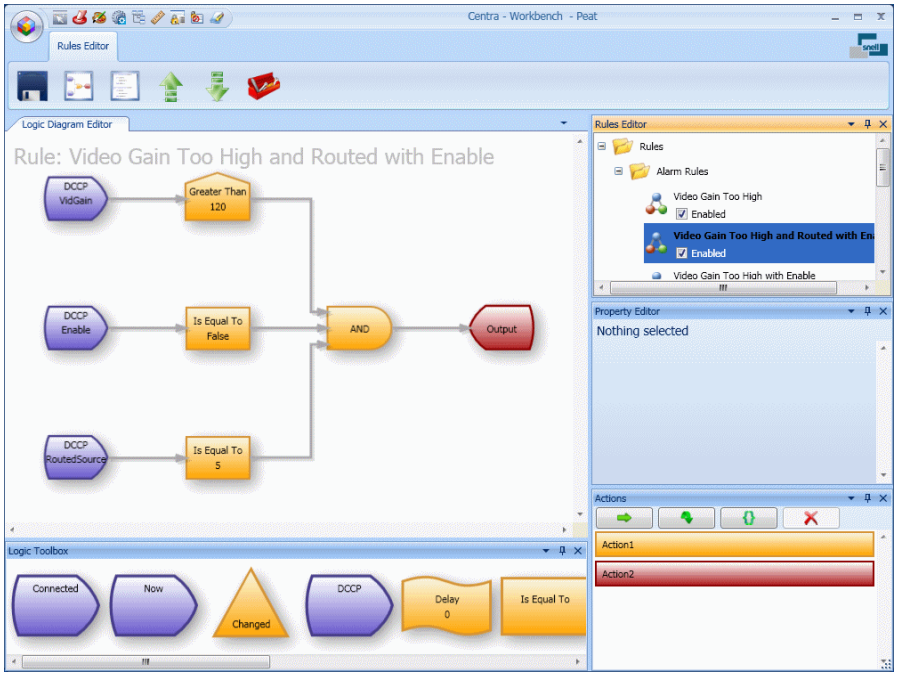

Fig 118. Rules Editor Design View

7.2 Rules Editor

The Rules Editor lists the available Rules.

To select which rules are in operation, select ☑ or clear ☐ the **Enabled** checkbox. The rules in operation can also be set from the Rules Service, See “Rules Service” on page 135.

To add a new Rule:

1. Open the Rules Editor tab at the bottom-right of the window.
2. Right-click on the **Rules** folder and select **Add New Folder**. To rename the Folder, click in the folder name and type directly into the name field.
3. Right-click on the new folder and select **Add New Rule**. To rename the Rule, click in the Rule name and type directly into the name field.
4. To edit the new Rule, double-click on the Rule. The Rule displays in the **Logic Diagram Editor**. By default, the editor shows a single **Output**.

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7.3 Toolbar

Table 33. lists the toolbar buttons:

Button	Description
	Save: Saves the changes to the current rule.
	Export: Exports the rule as a rules language file, or a raw XML file
	Import: Imports a rule from a rules language file, or a raw XML file
	Displays the following editors: • Rules Editor • Property Editor • Actions • Toolbox • Inputs • Logic

Table 33. Toolbar Buttons

7.4 Toolbox

Fig 119. lists the logical actions in the Design View toolbox.

Fig 119. Toolbox

To place an action, click on the required action and position it in the Logic Diagram Editor.

Inputs are automatically placed at the left of the window. Actions are automatically placed in the centre of the window, and the Output is always placed at the right of the window.

7.4.1 Inputs

The inputs (colored purple) are:

- Connected
- Now
- DCCP

The Inputs window lists the currently active inputs.

7.4.1.1 Connected

This checks to see whether the selected controller is connected, and returns a boolean TRUE or FALSE. To add a Connected input, either select it from the toolbox or click the button.

7.4.1.2 Now

Uses the current date or time (system time) as the input to a Rule. To add a Now input, either select it from the toolbox or click the button.

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Note: A Now input does not cause an event to fire so it must be used in conjunction with a DCCP input, see 7.4.1.3.

A now input must be followed by one of three operators: 'Equal To', Less Than' or 'Greater Than'. For example, an operation equivalent to (Now.Time > '12:00:00') returns TRUE if the current time is after noon, and FALSE any time before that.

When writing the string into an operator for comparison purposes, several formats are accepted:

- Time: One second after noon can be expressed as:

  12:00:01 (hh:mm:ss preferred)

  120001 (hhmmss)

  12:0:1 (h:m:s)

- Date: The first of January 2009 can be expressed as:

  01/01/2009 (dd/mm/yyyy preferred)

  01/01/09 (dd/mm/yy. A two-digit year, 2000s is assumed)

  01012009 (ddmmyyyy)

  010109 (ddmmyy. A two-digit year, 2000s is assumed)

  1/1/9 (d/m/y)

- Day of the Week: The format must be the full day in words.

  Monday

7.4.1.3 DCCP

This associates an input with a DCCP field. To add a DCCP input, either select it from the toolbox, or click the button from the Inputs editor.

Each physical entry in the controller's database has an **OID** address (Object Identifier). Navigate to the required OID either from the Behavior drop-down list in the Property Editor, or click the ... button to open the **Choose Dccp Field** browser, see Fig 120.

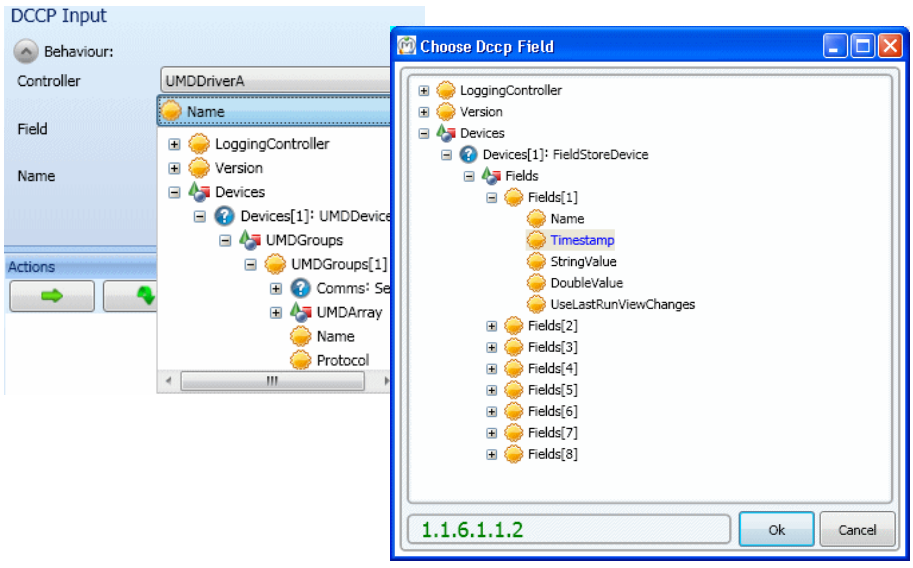

Fig 120. Select DCCP Field

It is possible to copy the OID and paste it into the relevant DCCP behavior of another control.

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7.4.2 Operators

The logical operators are:

- **Lookup**: A **"**lookup driver**"** must be present on a controller. Add a lookup table with sensible input and output values and then associate the lookup block with this driver. The block translates its input to an output based on the data in the table.
- **Changed**: If the input value changes, the Rule is fired.
- **Delay**: The input value must remain the same for at least the value set in the delay (in seconds). For example, if the delay is set to three seconds, the input must not change within that time.

The following operators can have multiple inputs:

- **Is Equal To**: All input values must equal the set value.
- **Greater Than**: All input values must be greater than the set value.
- **Less Than**: All input values must be less than the set value.

The Equal To, Greater Than and Less Than actions can be set to either compare a **Threshold value** (a set value), or to **Compare with each other** (boolean). Fig 121. Shows an example of two methods that return TRUE when both inputs equal 10:

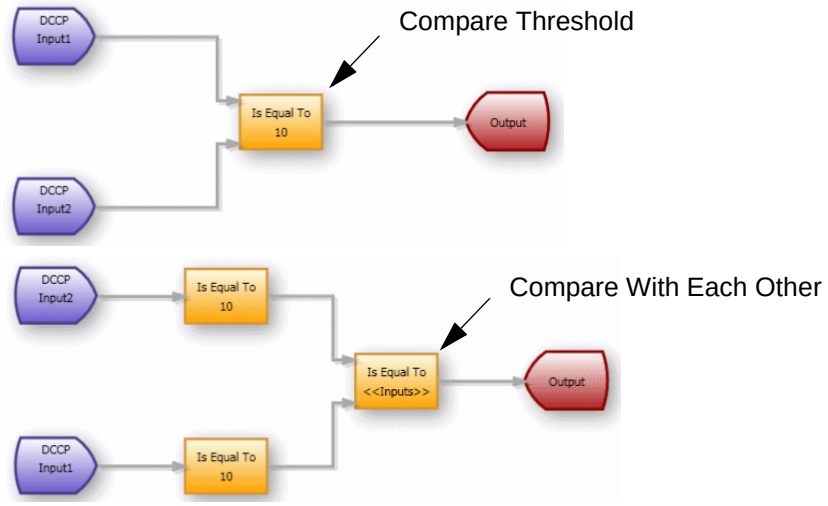

Fig 121. Compare Examples

The following logical operators are placed after (to the right) of an Is Equal To, Greater Than or Less Than, or placed adjacent to another logical operator.

- **AND**: All input values must be TRUE.
- **NOT**: All input values must be FALSE.
- **OR**: At least one of the input values must be TRUE.

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7.4.3 Connections

A Rule must have a valid connection made between all Inputs, Operators and the Output. Always make connections from left to right.

To make a connection between Inputs, Operators and the Output:

1. Double-click on the item to be connected. A red connection line extends from the item to the cursor.
2. Move the cursor to where a valid connection can be made, the line changes green.
3. Click to form the connection.

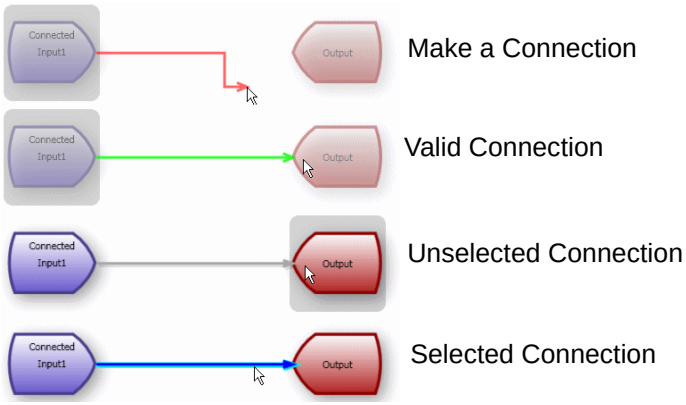

Fig 122. Connections

Note: Until a valid connection is made, the Inputs, Operators and the Output are greyed-out.

7.5 Property Editor

The behaviors of Inputs and Operators are set in the Property Editor.

To view or edit the properties of a control:

1. At the bottom-right of the window, select the **Property Editor** tab.
2. Select a control. The Property Editor displays information that is relevant to the selected control, see Fig 123.

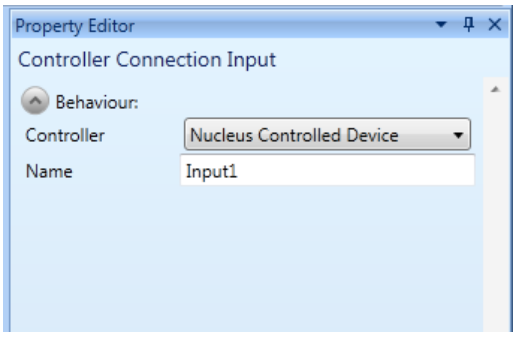

Fig 123. Properties Editor

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7.6 Actions

Actions determine what to do when a Rule's Output value is TRUE. There are five types of Action:

- **Set Value**: The Rule sets a DCCP to a specific value, see 7.4.1.3.
- **Copy Value**: The Rule copies a DCCP value from one location to another, see 7.4.1.3.
- **Call Function**: The Rule calls a function, with the specified parameters, if any, see 7.6.1.
- **Application**: The Rule starts an application.
- **DCCP Increment Value**: The Rule adds a value (positive or negative) to a DCCP value. It can also increment dates (units = days) and times (units = seconds).

The default action is to Fire when the Output is TRUE. The color of the Action is Yellow. Selecting the **Active Low** checkbox, sets the Rule to Fire when the Output changes from TRUE to FALSE. The color of the Action is Red.

7.6.1 Functions

A Function Rule can reset a controller. If a controller is set as a Router or Tie-lines device, there are additional options:

Tie-lines Function	Description
Reset	Resets the hardware on the controller card
ClearTielines	Routes a safe source to a tie-line destination
MakeRouteNative	Makes a route over tie-lines
MakeRouteNativeLocked	Makes a route over tie-lines (with locking)
MakeRoute	Makes a route over tie-lines
MakeRouteLocked	Makes a route over tie-lines (with locking)

Table 34. Tie-lines Functions

Router Function	Description
Reset	Resets the hardware on the controller card
SetCrosspoint	Routes the source to a destination
SetAssoc	Routes the source or destination by association
SetMonitorRow	Routes to a built-in monitoring destination
SetSalvo	Recalls a router salvo
SetProtect	Protects a destination
ClearProtect	Unprotects a destination
SalvoSnapshot	Saves the current crosspoint to a specific salvo

Table 35. Router Functions

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7.7 Logic

The Logic window shows the Rule as a text string. Add Inputs and Operators to the Rule in the Logic Diagram Editor, and the Logic string automatically changes to match. Edit the logic string by typing values and operators, and the changes are reflected in the Logic Diagram Editor.

To edit the logic text string, type a value or operator directly into the text string. The background of the Logic window changes to a pale yellow color to indicate that there is a difference between the Logic string and the Logic Diagram. To update the Logic Diagram click the button. If the Logic string is invalid, the background of the Logic window changes to a red color, and a description of the error is shown at the bottom of the window.

7.7.1 Operator Syntax

Table 36. lists the syntax for all the operators.

Operator	Syntax
Lookup	Lookup(“Controller IP Address:Port Number”, ? , Input Name) `lookup("127.0.0.1:1000", 0, Input1)`
Changed	valuechanged Input Name `valuechanged Input2`
Delay	(Input Name after 0) `(Input1 after 10)`

Is Equal To	Equal to: Compare with Threshold:
	`(Input1 = "10")`
	Equal to: Compare with Each Other:
	`(Input1 = Input 2)`

Greater Than	Greater Than: Compare with Threshold:
	`(Input1 > "10")`
	Greater Than: Compare with Each Other:
	`(Input1 > Input 2)`

Less Than	Less Than: Compare with Threshold:
	`(Input1 < "10")`
	Less Than: Compare with Each Other:
	`(Input1 < Input 2)`

AND	((Condition 1) and (Condition 2)) `((Input1 = 10) and (Input2 = 20))`
NOT	not (Condition) `not (Input1 = 10)`
OR	((Condition 1) or (Condition 2)) `((Input1 = 10) or (Input2 = 20))`

Table 36. Operator Syntax

Note: A Logic string can be copied from one Rule and pasted into another Rule. However, the two Rules must have the same Inputs.

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7.8 Rules Service

The Rules Service is an application that runs independently from Workbench. Multiple instances of the Rules Service can run together, each of which can run specific Rules, or sets of Rules.

In order for the rules to be active, the Rules Service must be running. Start the Rules Service from the Windows Start menu:

Start | All Programs | Snell | MCM | Rules Service

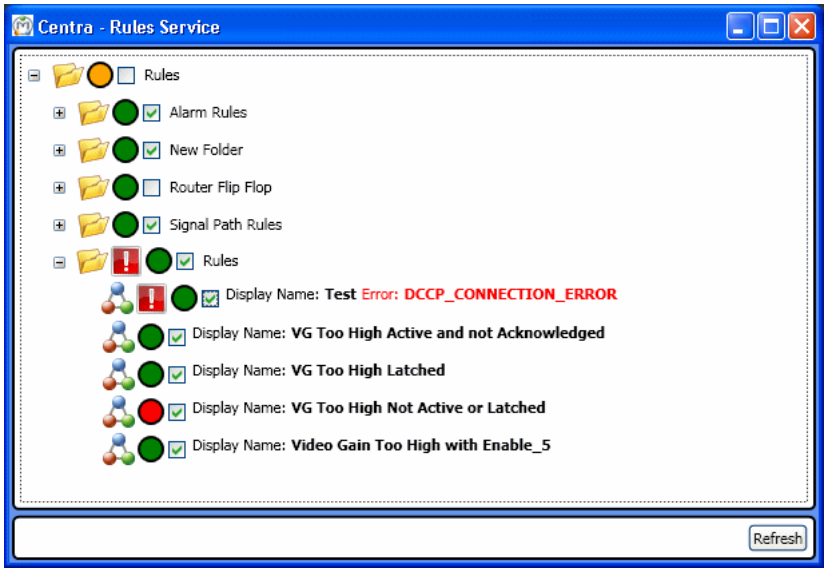
Centra - Rules Service
Rules
Alarm Rules
New Folder
Router Flip Flop
Signal Path Rules
Rules
Display Name: Test Error: DCCP_CONNECTION_ERROR
Display Name: VG Too High Active and not Acknowledged
Display Name: VG Too High Latched
Display Name: VG Too High Not Active or Latched
Display Name: Video Gain Too High with Enable_5
Refresh

Fig 124. Rules Service

To select which rules are in operation, select ☑ or clear ☐ the checkboxes for the Rule or Folder. The rules in operation can also be set from the Rules Service, See “Rules Editor” on page 128.

A folder name can be specified on the command line for the rules service to force it to load only children of that folder. For example:

RulesService.exe -folder "Router Flip Flop”

The active state of rules is set via the rules editor as well as via the Rules Service GUI.

Note: If two or more Rules set a value in the same DCCP destination, and there is a conflict, the value is set by the last Rule in the list that attempts to set a value.

7.8.1 Rules Status

The folders and rules show different colors depending on the status of the rules. Table 37. lists the possible states.

Icon	Description
●	Rule: Not Firing. The rule is running, but the conditions have not been met. That is, the conditions of the Rule are FALSE.
●	Rule: Firing. That is, the conditions of the Rule are TRUE.
●	One or more Rules within a folder are firing.
!	Error: one or more Rules have an error.

Table 37. Rules Status

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8. System Architecture

8.1 Description

The purpose of the System Architecture diagram is to capture information on system setup, the devices present, their inputs and outputs, the cables linking them together, and information on the controllers controlling them.

To open System Architecture, log in as a user with Architecture permissions, see section 4.3.

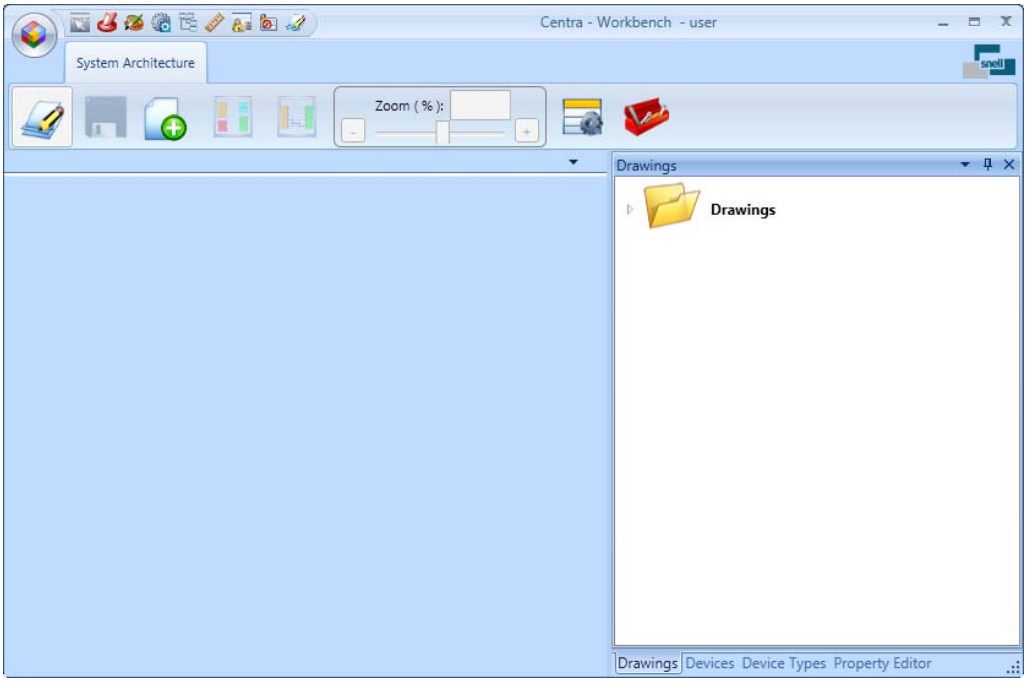


Fig 125. System Architecture

8.2 Toolbar

Table 38. lists the toolbar buttons:

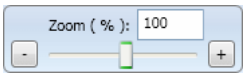
Button	Description
	Edit: Toggle the edit mode of the screen.
	Save: Saves the changes to the current drawing.
	New Drawing: Adds a new drawing.
	Layout View: Add new devices
	Cabling View: Add the cabling between devices
	Zoom: Adjusts the size of the screen.
	Setup tie-lines: Configure a tie-lines controller from the system architecture information

Table 38. Toolbar Buttons

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Button	Description
	Screens: Lists the screens available as tabbed windows at the right-hand side of the drawing area: • Property Editor, see section 8.5.2 • Device Types, see section 8.4 • Drawings, see section 8.5.1 • Devices, see section 8.5 Click on a screen to open that tabbed window. Alternatively, click on the relevant window tab.

Table 38. Toolbar Buttons

8.3 Menu

When in edit mode, performing a right-click on a device opens an editing menu:

Delete Selected	Deletes the current selection
Edit Pins	Edit the connecting pins for the current device
Show all attached cables	Display all cables attached to devices
Show cables attached on left	Display pins connected the left of the selected device
Show cables attached on right	Display pins connected the right of the selected device
Show cables attached on top	Display pins connected the top of the selected device
Show cables attached on bottom	Display pins connected the bottom of the selected device
Properties	Opens the Property window for the current selection
Screen Properties	Opens the Property window for the current drawing

8.4 Device Types

Device types are templates for devices that specify information on a type of device.

To create a new device type:

1. Select the **Device Types** tab (bottom-right of the window).
2. Right-click and select **Add New Device Type**. The Device Editor displays, see Fig 126.

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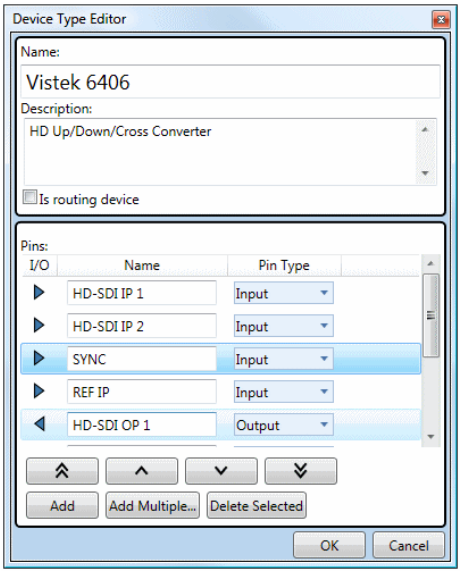

Fig 126. Device Types Editor

3. If the device is a Router, check the **Is Router Device** checkbox.
4. A pin description is a either an input or output. For each Pin, click the **Add** button.
   - Type a pin **Name**.
   - Select a **Pin Type** from the drop-down list.
   - Type the **Signal Path**. This is the number of the pin that the pin is connected to.

   Use the buttons near the bottom of the editor to rearrange the order of the pins.
5. Click **OK**. The new device type is added to the list of devices, see Fig 127.

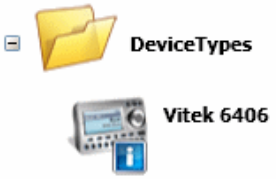

Fig 127. Device Types List

8.4.1 Import/Export Device Types

Device types files all have the **.devtype** file extension.

To import a Device Type:

1. Right-click anywhere in the Device Types window and select **Import**.
2. Browse to the location and select the appropriate **.devtype** file.
3. Click **Open**.

To export a Device Type:

1. Right-click on the Device Type to be exported and select **Export**.
2. By default, the filename is the same as the device name, with the **.devtype** file extension. Browse to the location to save the file, and click **Save**.

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8.5 Devices

Devices and cables exist independently of drawings. Adding a device to a drawing does not create a new device, it simply copies that particular device from list. Similarly, removing a device from a drawing does not delete that device from the list.

The Device tab shows all the available devices. Multiple devices can be placed on a single drawing, and a device can be placed on multiple drawings.

To add a new device.

1. Select the **Device** tab (bottom-right of the window).
2. Right-click and select **Add New Device**. The Create Device wizard displays.
3. Type a unique name for the device, and click **Next**.
4. Select whether to:

   Create a new device based on a device type

   a Select the **Device** type from the drop-down list.

   Create a new device based on a router matrix

   a Select the **Controller** from the drop-down list.

   b Select the **Matrix** from the drop-down list.
5. Click **OK**. The new device is added to the list of devices, see Fig 128.

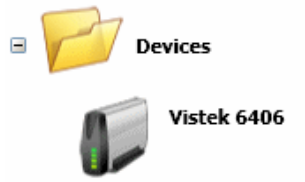

Fig 128. Devices List

8.5.1 Add a Device to a Drawing

To add a device to a drawing:

1. Select the **Drawings** tab (bottom-right of the window).
2. Double-click on the required drawing.
3. On the toolbar, click the button, and the button.
4. Select the **Device** tab (bottom-right of the window).
5. Double-click on the device to be added.
6. Drag and place the device on the drawing, see Fig 129.

Fig 129. Example Device

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8.5.2 Device Properties

To view or edit the properties of a device, open the property editor tab (bottom-right of the window).

Some properties are specific to the selected device in the drawing, such as the size, show pin names, show description and so on. The Device Settings properties apply to all instances of the device, for example, color, controller, mimic settings etc.

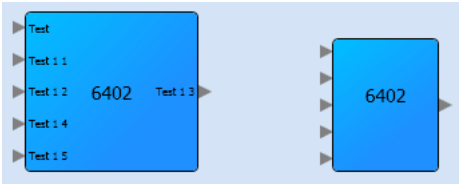

Fig 130. Example Device Properties

8.6 Pin Editor

To edit the pins for a device, right-click and select **Edit Pins...** The Pin Editor displays. Each pin has an icon that indicates its type, see Table 39.

Icon	Type
	Input
	Output
	Two Way

Table 39. Pin Types

8.6.1 Names and Connections

The Names and Connections tab is for changing pin names and to managing connections to other devices, see Fig 131.

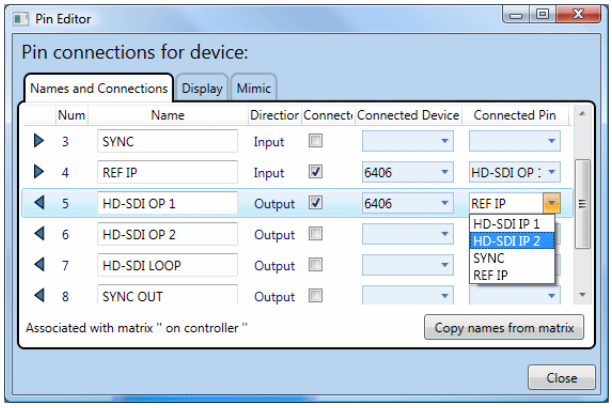

Fig 131. Pin Names and Connections

8.6.2 Display

The Display tab is used to change the way that pins are displayed for this particular block on the drawing.

Note: Changes are made only to the selected block.

Select which pins are visible, which edge they are displayed on, and in what order. Select multiple pins to apply edits to more than one pin at the same time, see Fig 132.

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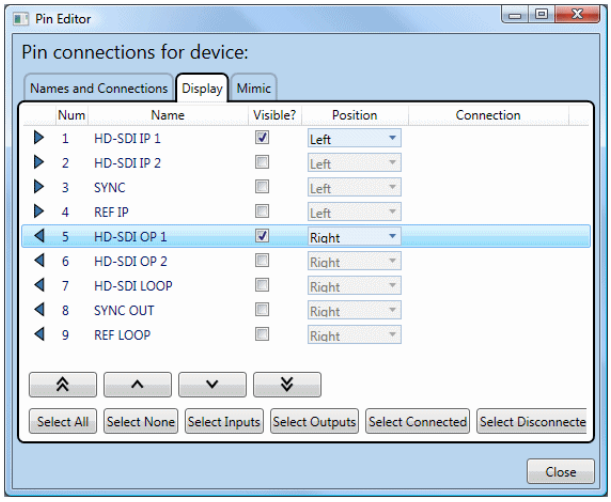

Fig 132. Pin Display

8.6.3 Mimic

A Mimic Diagram shows the cabling and routing between device. Also, explore and manipulate signal paths through a broadcast system, see Fig 133.

Section A.13 shows a worked example of a simple, single matrix architecture, with two video servers as inputs, and two multiviewers as outputs.

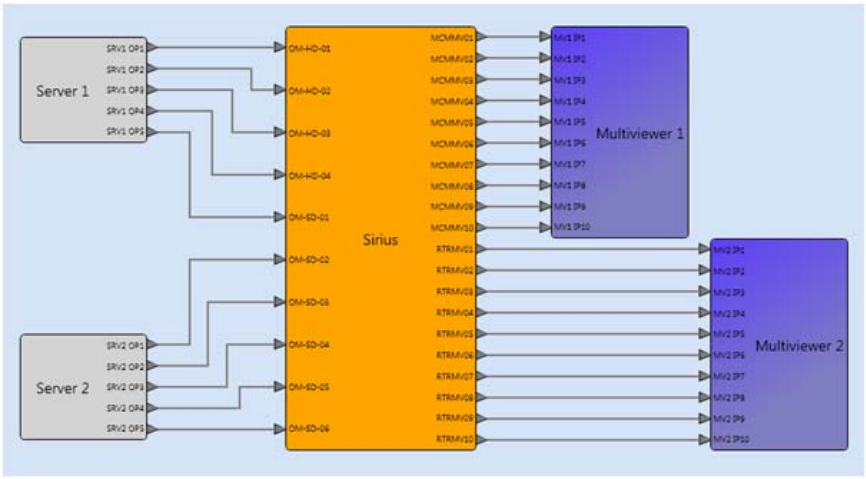

Fig 133. Mimic Diagram

The basic requirements for a Mimic Diagram are:

- One or more router matrices (linked by tie lines if there are more than one)
- A set of re-entrant devices, with their inputs and outputs linked into the same matrix
- A set of inputs and outputs for the system (generally servers, incoming lines, multiviewers, monitors, and so on)
- A router controller
- A tie lines controller

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8.7 Cables

Link devices together with cables.

1. To link an input to an output, click the button on the toolbar.
2. Click on the output pin to be connected. A red connection line extends from the pin to the cursor.
3. Move the cursor to an input pin where a valid connection can be made, the line changes green.
4. Click to form the connection.

Pins with cables attached are shown with a bold outline.

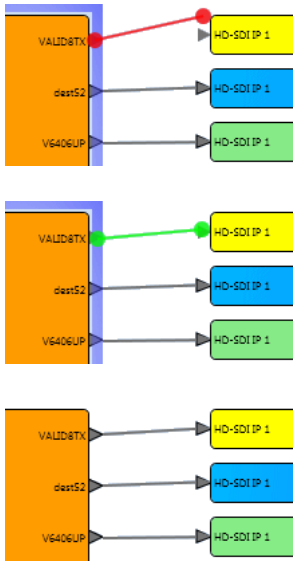

Fig 134. Cable Connections

8.7.1 Cable Routing

To make system architecture drawings easier to understand, add corners to a cable.

To create corners on a cable:

1. When in cable mode, move the mouse over the cable. The cursor changes to a pen shape when over the cable.
2. Click and drag to position a corner.
3. Release the mouse button to fixed the position of the corner

Multiple corners can be added to aid clarity of a diagram. Existing corners can be repositioned by selecting the node and moving it.

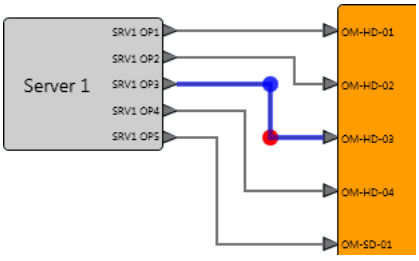

Fig 135. Cable Routing

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Appendix A. Worked Examples

The following examples assume a working installation and pre-configured controllers.

A.1 XY Soft Panel

A.1.1 Create New Panel

Fig 136. shows the finished panel; it has four sources and four destinations. The route for each signal is set by selecting a destination, then a source, and clicking the **Take** button.

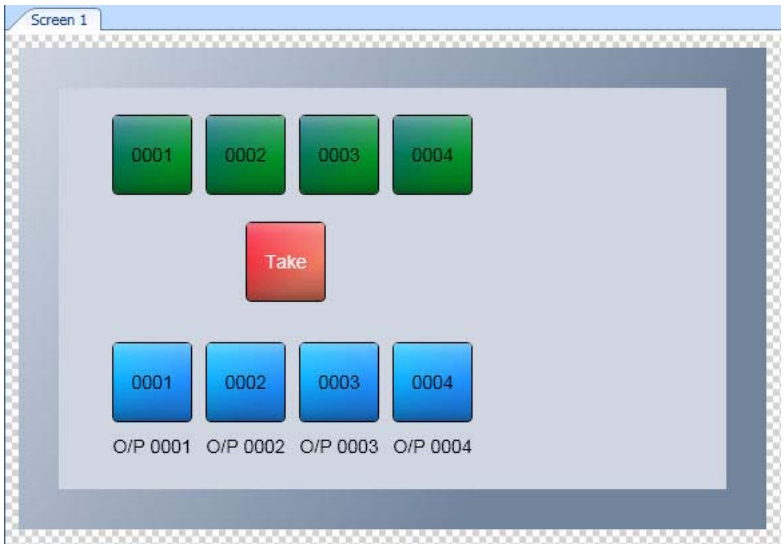

Fig 136. XY Panel With a Take Button

Prerequisites: A device controller (or simulator) must be attached for the following procedure to work correctly.

A.1.1.1 Add New Screen

1. Open the Workbench Design window.

Note: By default, the first time the Design window is opened, the first screen in the list is shown. Subsequently, the design view displays the default screen.

2. At the bottom-right of the window, select the **Screens Editor** tab.

3. Either on the **Screens Editor** tab click the **Add** button, or on the toolbar click the button. The **Add New Screen** dialog box displays. Type a name for the new screen (for example, Screen 1) and click **OK**. The new screen is added to the list.

Note: To open any screen in the list, double-click on the thumbnail. Only one screen can be open at a time.

A.1.1.2 Modify Screen Properties

1. On the toolbar, click the button. The **Toolbox** displays at the bottom of the window.

2. Next to the **Screens Editor** tab, select the **Property Window** tab. Alternatively, right-click anywhere outside the panel and select **Screen Properties**.

3. Change the size of the screen to 390 x 560 (all dimensions are in pixels).

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A.1.1.3 Modify Panel Properties

1. Click anywhere on the panel, and from the property window, set the Sizing to 330 x 500, and the Position to left = 30, top = 30.

Note: The panel can be positioned anywhere on the screen by clicking and dragging the panel.

2. Click the + button at the top-right of the panel. This creates a new Group tab called **Group 1**.

3. Click the **Group 1** tab and then the ☰ button. The **Group** properties display in the property window.

Note: Double-click on a panel to lock it in place (the screen color changes).

A.1.1.4 Modify Group Behavior

1. From the **Behavior** drop-down list, select **Router XY Behavior**. The full properties for this router are shown.

2. Select a **Matrix** and **Level** from the drop-down lists.

3. Make sure **Takes Required** is set to **Single**.

4. Make sure the Use Association Names checkbox is checked:

   The Association Names are set in the Controller Configuration, Router properties.

A.1.1.5 Add Source Buttons

1. On the toolbar set the Create Grid button to Rows = 1 and Columns = 4, and click the Grid button. The background color of the grid button changes indicating that it is selected.

Fig 137. Grid Button

2. From the Toolbox at the bottom of the screen, click the **Button** control. Drag the cursor and place the buttons on the screen.

Note: If the Create Grid button is not toggled on, then only a single button is added.

Fig 138. Add Buttons

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A.1.1.6 Move Buttons

To move the buttons:

1. Either move them individually, or hold the Ctrl key down and drag the cursor around the buttons to multiple select them, or hold the Shift key and click individual buttons to select a number of them.
2. Drag the buttons to the required positions, or enter values in the property window.

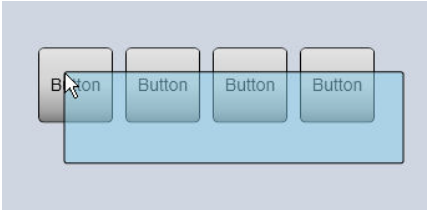

Fig 139. Multiple-select Buttons

A.1.1.7 Set Button Sources

1. Select one or more buttons, and from the property window change the **Behavior** from **Passive** to **Source**. The color of the buttons change to green.
2. For each source button in turn, click the **Source Association** drop-down list and select a **Source**.

A.1.1.8 Add Destination Buttons

1. To create the destination buttons, either repeat the steps for creating the source buttons, or copy and paste the source buttons, then change the properties.

Note: Copies of buttons do not retain their labels.

2. Select one or more buttons, and from the property window, change the **Behavior** to **Destination**. The color of the buttons change to blue.
3. For each destination button in turn, click the **Destination Association** drop-down list and select a **Destination**.

A.1.1.9 Add a Take Button

A Take button confirms the selection of a source and destination.

1. From the toolbox at the bottom of the screen, select the **Button** control, and place a single button on the screen.
2. Change the **Behavior** from **Passive** to **Take**. The color of the button changes to red.

A.1.1.10 Add a Tally

A Tally is a label that confirms that an action has been done.

1. From the toolbar, click the **Label** control. Add a label below one of the destination buttons and resize it so that it is the same width as the button.
2. Either add labels to the other buttons, or copy the label and paste it below the other destination buttons.
3. Select the labels and from the property window, change the Behavior to **Text tally**.
4. For each tally, from the property window, change the **Destination Association** and **Level** so that it has the same destination as the button above it. The Tally shows the Source name set in the Controller Configuration: Router properties.

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A.1.1.11 Save the Screen

- From the toolbar click the button.

Note: To set the screen as a default, from the Administration page, select the screen from the Initial Screen drop-down list, see section 4.2.

A.1.1.12 Test the Screen

1. Select **Run** from the main menu.

Note: It can take several seconds for the panel to communicate with the controller.

2. Click one of the destination buttons, the button changes color.
3. Select a source, the source button changes to a dim light.
4. Click the **Take** button to route the selection; the source button changes to a bright color. When switching between destinations the source button changes with the active source.

A.1.2 Clone Panel Without a Take Button

Copy and edit the screen created in see section A.1.1 so that it does not have a Take button. In this case, selecting a destination and then pressing the source also routes the signal.

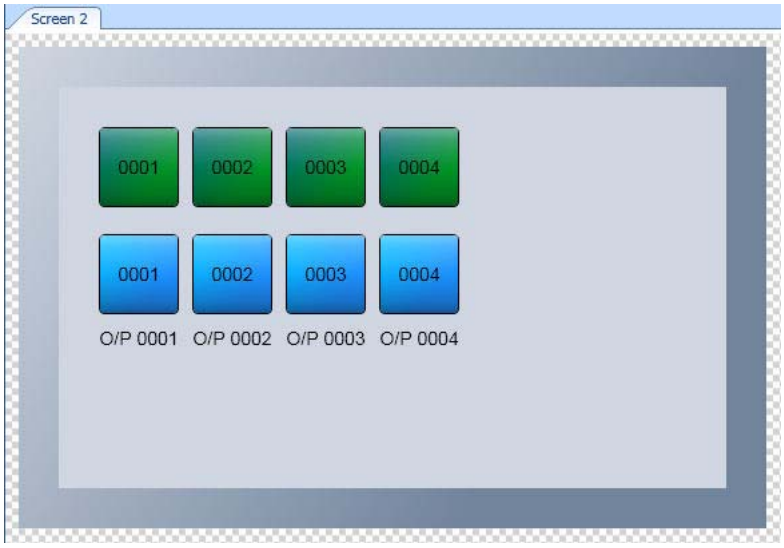

Fig 140. XY Panel Without a Take Button

1. At the bottom-right of the window, select the **Screens Editor** tab. Right-click on the screen and select **Clone Screen**. The **Enter Screen Name** dialog box displays. Type a name for the new screen (for example, Screen 2) and click **OK**. The new screen is added to the list.
2. Double-click on the new screen to open it in the editor.
3. On the toolbar, click the button.
4. Delete the **Take** button, and move the destination buttons and tallies up.
5. Click the Group 1 tab and then the button. The group properties display in the property window.
6. On the toolbar, click the button.
7. Test the Screen by selecting **Run** from the main menu.

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Note: It can take several seconds for the panel to communicate with the controller.

8. Click one of the destination buttons, the button changes color.
9. Select a source, and the source button changes to a bright color. When switching between destinations the source button changes with the active source.

A.1.3 Link Panels Together

Add buttons to the two panels, to allow switching between them. A route selected on one panel is also shown on the other panel.

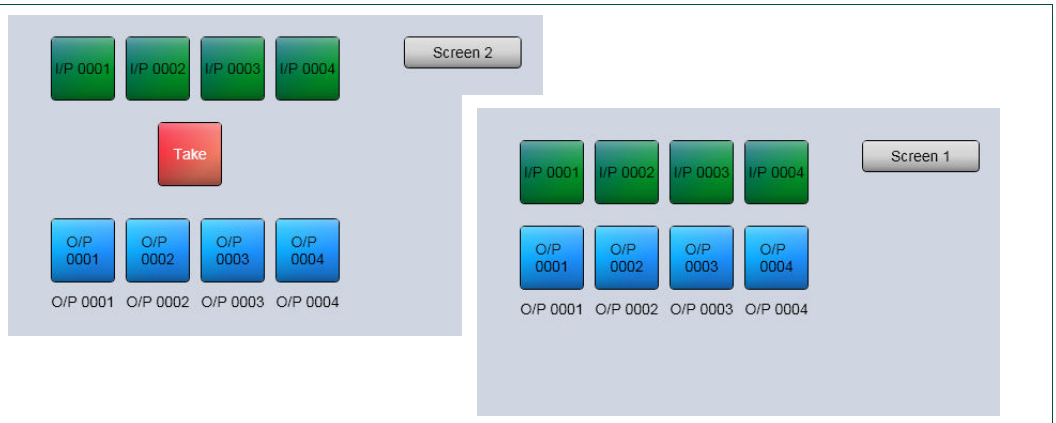

Fig 141. XY Panels with Buttons for Switching Between Screens

1. Open the Panel without a Take Button, see section A.1.1.
2. Add and resize a new button.
3. Set the **Behavior** to **Screen**, and **Behavior Specific** to **Screen 2** (the panel without a take button). If necessary, change the **Caption** to Screen 2 and clear the **Show Screen Name** checkbox.
4. Copy the new button, and save the screen.
5. Open the Panel without a Take Button.
6. Edit the panel and paste the new button.
7. Set the **Behavior Specific** to **Screen 1** (the panel without a take button). If necessary, change the **Caption** to Screen 1 and clear the **Show Screen Name** checkbox.
8. Save the screen.
9. Test the Screens by selecting **Run** from the main menu.

Note: It can take several seconds for the panel to communicate with the controller.

10. On either panel, route the signals as required. When switching between panels, both panels show the same settings.

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A.2 BPX Soft Panel

A BPX panel is a one-button per crosspoint style of panel. The operator pushes one of the buttons and a source to destination route is made.

Fig 142. shows the finished four-by-four panel. The panel allows a monitor to view any of the four sources. The active route is shown in green and the inactive in red.

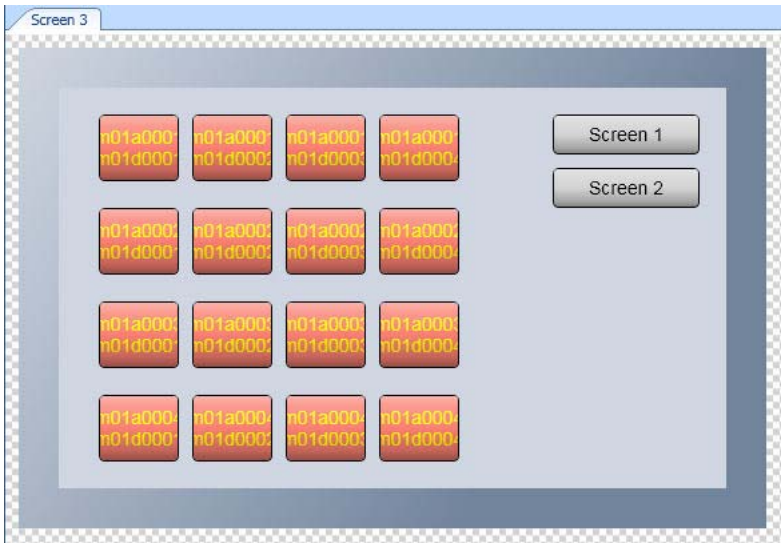

Fig 142. BPX Panel

Prerequisites: A device controller (or simulator) must be attached for the following procedure to work correctly.

A.2.1 Create New Screen

1. Open the Workbench Design window.

Note: By default, the first time the Design window is opened the first screen in the list is shown. Subsequently, the design view displays with the default screen.

2. At the bottom-right of the window, select the **Screens Editor** tab.

3. Either on the **Screens Editor** tab click the **Add** button, or on the toolbar click the button. The **Add New Screen** dialog box displays. Type a name for the new screen (for example, Screen 1) and click **OK**. The new screen is added to the list.

Note: To open any screen in the list, double-click on the thumbnail. Only one screen can be open at a time.

A.2.2 Modify Screen Properties

1. From the toolbar, click the button. The **Toolbox** displays at the bottom of the window.

2. Next to the **Screens Editor** tab, select the **Property Window** tab. Alternatively, right-click anywhere outside the panel and select **Screen Properties**.

3. Change the size of the screen to 390 x 560 (all dimensions are in pixels).

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A.2.3 Modify Panel Properties

1. Click anywhere on the panel, and from the property window, set the dimensions to 330 x 500, and the Position to left = 30, top = 30.

Note: Click and drag the panel to any position in the screen.

2. Click the + button at the top-right of the panel. This creates a new Group tab called **Group 1**.

3. Click the **Group 1** tab and then the ☰ button. The **Group** properties open in the Property Window.

A.2.4 Modify Group Behavior

1. From the **Behavior** drop-down list, select **Router BPX Behavior**. The full properties for this router are shown.

2. Select a **Matrix** and **Level** from the drop-down list.

A.2.5 Add Buttons

1. From the toolbar set the Create Grid button to Rows = 4 and Columns = 4, and click the Grid button. The background color of the grid button changes to blue indicating that it is selected.

Fig 143. Grid Button

2. From the Toolbox at the bottom of the screen, click the **Button** control. Drag the cursor and place the buttons on the panel.

Note: If the Create Grid button is not toggled on, then only a single button is added.

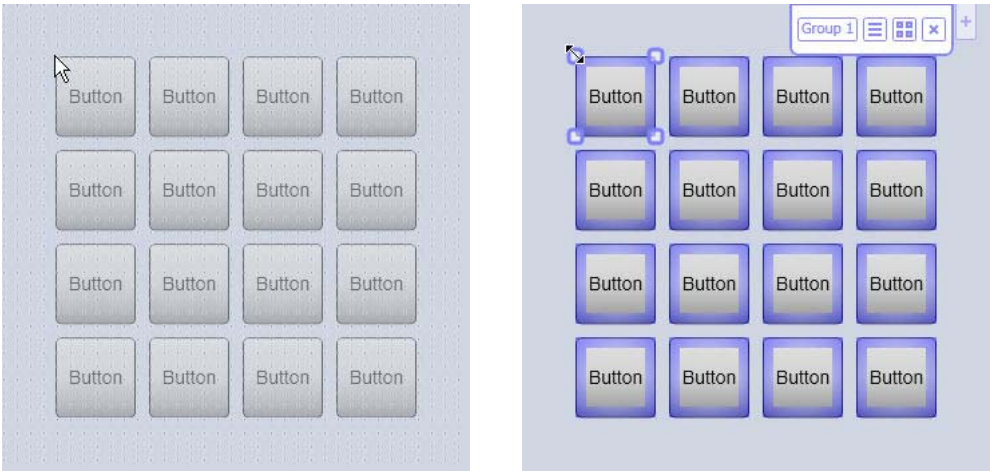

Fig 144. Add Buttons

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A.2.6 Move Buttons

To move the buttons:

1. Either move them individually, or hold the Ctrl key down and drag the cursor around the buttons to multiple select them.
2. Drag the buttons to the required positions, or enter values in the property window.
3. Select all the buttons and change their **Behavior** to **BPX**. The color of the button changes to red.

A.2.7 Assign a Source and Destination to Each Button

1. Select the top row of buttons, and select a source association. Repeat the process for the other three rows, selecting a different source for each row.
2. Select the first column of buttons, and select a destination association. Repeat the process for the other three columns, selecting a different destination for each row.

   Alternatively sources and destinations can be automatically assigned. See “Add Buttons to Link Panels” on page 150.

A.2.8 Add Buttons to Link Panels

Add buttons on each of the XY panels to link to the BPX router panel, and from the BPX panel to each of the XY panels.

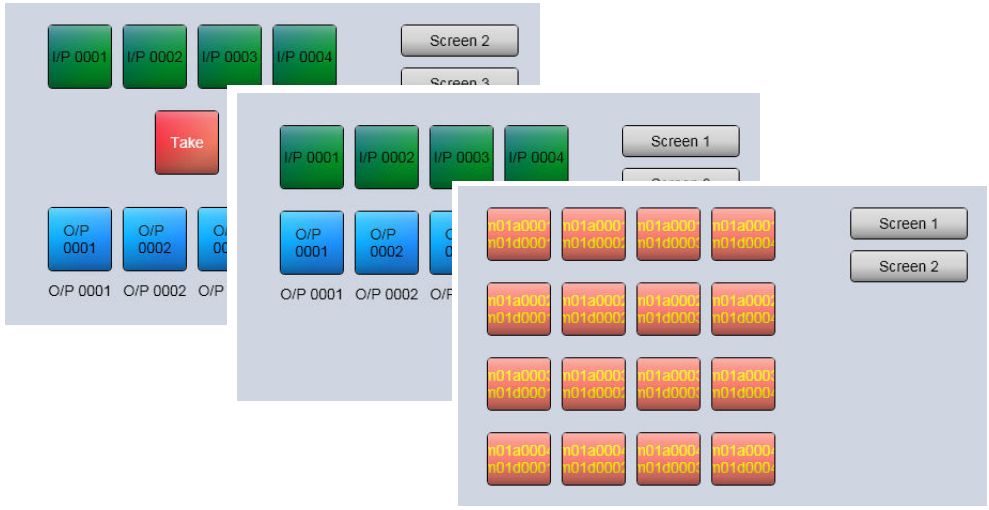

Fig 145. Link Panels

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A.3 Alarm Soft Panel

An alarm panel is useful, for example, to indicate the status of router fans and PSUs. Any unit failing is immediately obvious from the screen, and action can then be taken.

Fig 146. shows an example alarm panel.

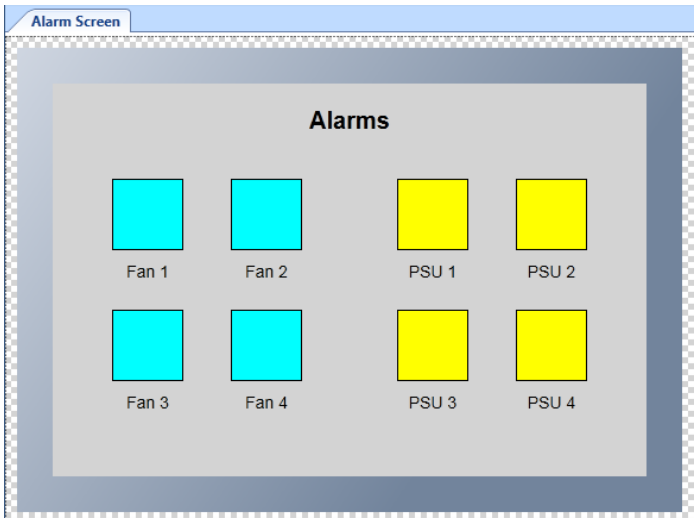

Fig 146. Alarm Screen

A.3.1 Create New Screen

1. Open the Workbench Design window.

Note: By default, the first time the Design window is opened, the first screen in the list is shown. Subsequently, the design view displays the default screen.

2. At the bottom-right of the window, select the **Screens Editor** tab.

3. Either on the **Screens Editor** tab click the **Add** button, or on the toolbar click the button. The **Add New Screen** dialog box displays. Type a name for the new screen (for example, Alarm Screen) and click **OK**. The new screen is added to the list.

Note: To open any screen in the list, double-click on the thumbnail. Only one screen can be open at a time.

A.3.2 Modify Screen Properties

1. On the toolbar, click the button. The **Toolbox** displays at the bottom of the window.

2. Next to the **Screens Editor** tab, select the **Property Window** tab. Alternatively, right-click anywhere outside the panel and select **Screen Properties**.

3. Change the size of the screen to 390 x 560 (all dimensions are in pixels).

A.3.3 Modify Panel Properties

1. Click anywhere on the panel, and from the property window, set the Sizing to 330 x 500, and the Position to left = 30, top = 30.

Note: The panel can be positioned anywhere on the screen by clicking and dragging the panel.

2. Click the button at the top-right of the panel. This creates a new Group tab called **Group 1**.

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3. Click the **Group 1** tab and then the button. The **Group** properties display in the property window.

Note: Double-click on a panel to lock it in place (the screen color changes).

A.3.4 Modify Group Behavior

1. From the Behavior drop-down list, select **Alarm Behavior**.
2. Define a name for the group, if required, for example “Alarms”.

A.3.5 Add an Image Tally

1. From the Toolbox at the bottom of the screen, click the **Image** control. Drag the cursor and place the image Tally on the panel.
2. In the Property Window, select the Group defined above from the drop-down list.
3. Select **Image Tally** from the Behavior drop-down list.
4. Click on the OID Browse button ( ).

   The Choose DCCP Field window displays.

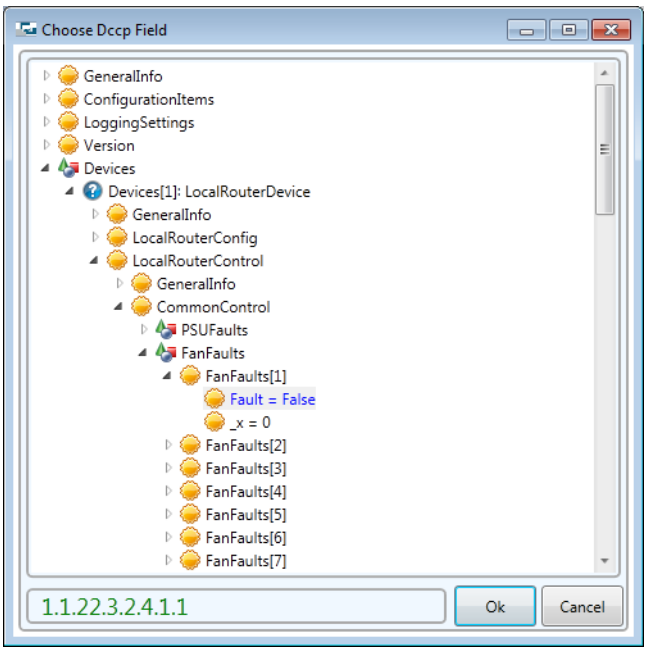

Fig 147. Fan Fault OID

5. Navigate to Fan Fault 1. and click **OK**.

   In this example the associated OID is 1.1.22.3.2.4.1.1 This number will be of use later.
6. Click on the **Brush/Value Settings** button.

   The Tally Brush Editor displays.

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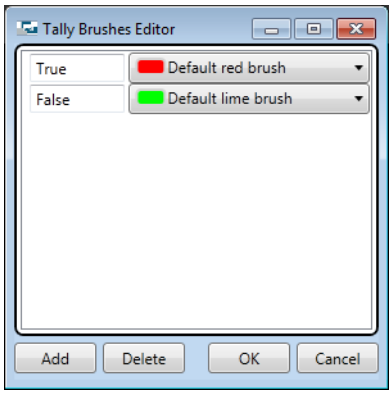

Fig 148. Tally Brush Editor

7. From the drop-down lists, select colors for the Image Tally to display when the fan is OK, or in fault status.

Note: In the example screen, the Image Tally displays red when the status is True, i.e. the Fan is in fault mode, and displays green when the status is False, i.e. the fan is not in fault mode.

8. Click **OK**.

A.3.6 Add a Label

1. From the Toolbox at the bottom of the screen, click the **Label** control. Drag the cursor and place the label on the panel directly below the Image Tally.
2. In the Property Window, select the Group defined above from the drop-down list.
3. Select **Passive** from the Behavior drop-down list.
4. Edit the text to change the name to “Fan 1”.

A.3.7 Add More Image Tallies

Due to the similar nature of the alarms being setup in this example, there are various shortcuts that can be taken to create the panel.

1. Copy and paste the Image Tally and Label.
2. Select the copied Label, and from the Property window, change the name to “Fan 2”.
3. Select the copied Image Tally, and in the Property Window, click on the OID Browse button ( ).
4. The existing OID from the first Image tally will be present. Navigate to Fan Fault 2 and click **OK**.

   In this example the associated OID is 1.1.22.3.2.4.2.1

   Compare this to the OID of the first image tally (1.1.22.3.2.4.1.1), and it is apparent that in this case just the penultimate number has changed from “1” to “2”. It can therefore be determined that for Fan 3 the fault OID be 1.1.22.3.2.4.**3**.1.
5. To create further Fan Fault Image Tallies, simply copy and paste an Image Tally and Label, edit the text of the label, and edit the OID of the Image Tally.

The PSU Image Tallies in this example were created in exactly the same way, but with a starting OID of 1.1.22.3.2.2.1.1 for PSU 1, and then again changing the penultimate number for subsequent PSU faults.

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A.4 Live Renaming of Sources and Destinations

For Router Devices, the Source and Destination names (including their alternative Tag Names) can be changed while in Run mode.

1. Add a new Group, set the **Group** behavior to **Tag Name Editing Behavior**, and set the **Controller** to a valid Router Device Controller.
2. Add a List Box, and give it an appropriate name. Set the behavior to **Property Selection**.
3. From the **Behavior Specific** section, set the **Array** to **SourceAssocs** (or **DestAssocs**), see Fig 149.

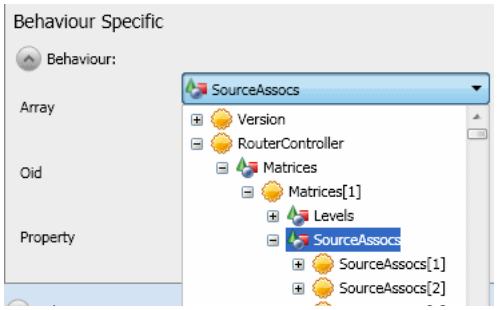

Fig 149. List Box - Array Selection

4. From the **Behavior Specific** section, set the **Property** to the name to be selected, see Fig 150. In Run mode, the list box displays the list of Names.

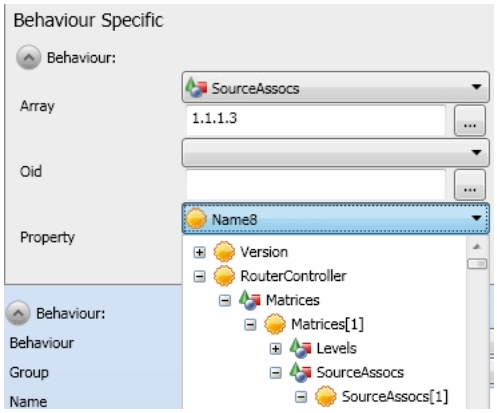

Fig 150. List Box - Property Selection

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A.5 Numeric Controls

This example shows how to configure a Slider, Up and Down, or Composite controller control to set a value in a controller.

1. Create a new panel.
2. Add a new **Group** and set it to **Generic behavior**.
3. Add a **Numeric** control and set the **Minimum** and **Maximum** values (For example, 1 and 10). For Composite sliders, set the **Calibrated** Value.
4. Set the **Behavior** to **DCCP**.
5. Set **Oid** property to an appropriate **DoubleValue**, see Fig 151.

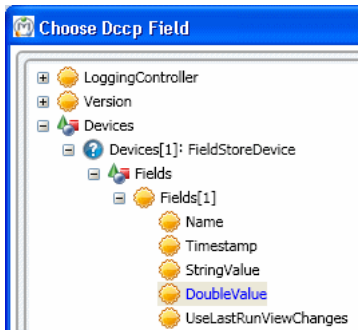

Fig 151. List Box - Property Selection

To show that the Numeric Control works at run time, add a Label that displays the slider value:

6. Add a **Label** control, and assign it to the same group as the slider.
7. Set the **behavior** to **DCCP**.
8. Copy the **OID** value from the slider, and paste it into the label behavior specific OID.
9. Save and run the example. As the slider is moved, the label displays the current value.

A.6 Radio Buttons

This example shows how to configure a Radio Button control to set a value in a controller.

1. Create a new panel.
2. Add a new **Group** and set it to **Generic behavior**.
3. Add a **Radio Button** control.
4. Set the **behavior** to **DCCP**.
5. Set **Oid** property to an appropriate field (use numeric values for DoubleValue fields). For example, see Fig 152.

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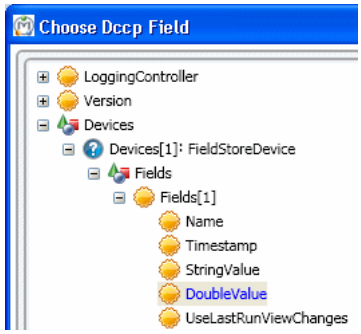

Fig 152. Radio Button Property Selection

6. Click the **Lookup Values** button. The Lookup Values dialog box displays, see Fig 153.

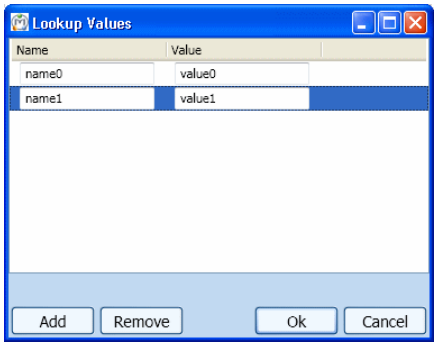

Fig 153. Radio Button Lookup Values

7. Click **Add** for each option.
8. For each option, type a **Name** and the required DCCP **Value**.
9. Click **OK**.
10. Save and run the example. As the slider is moved, the label displays the current value.

Note: The radio buttons are not visible until runtime.

To show that the Radio Button control works at run time, add a Label that displays the Radio Button's value:

11. Add a **Label** control, and assign it to the same group as the Radio Button.
12. Set the **behavior** to **DCCP**.
13. Copy the **OID** value from the Radio Button, and paste it into the label behavior specific OID.
14. Save and run the example. As the Radio Buttons are selected, the label displays the current value, see Fig 154.

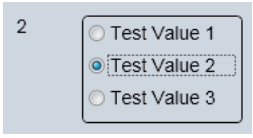

Fig 154. Radio Button Example

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A.7 Monitor Buttons

Buttons can be added to a screen to monitor outputs. The monitors work on a single matrix and single level. Monitors are only available on Nucleus controllers.

A.7.1 Add Monitor Buttons to an XY Panel

1. Add a panel with an XY router group, and Source and Destination buttons. See “XY Soft Panel” on page 143.
2. Add a new button, and set the **behavior** to **Monitor**.
3. Set the **Row** property to the required monitor number (according to the router connected).

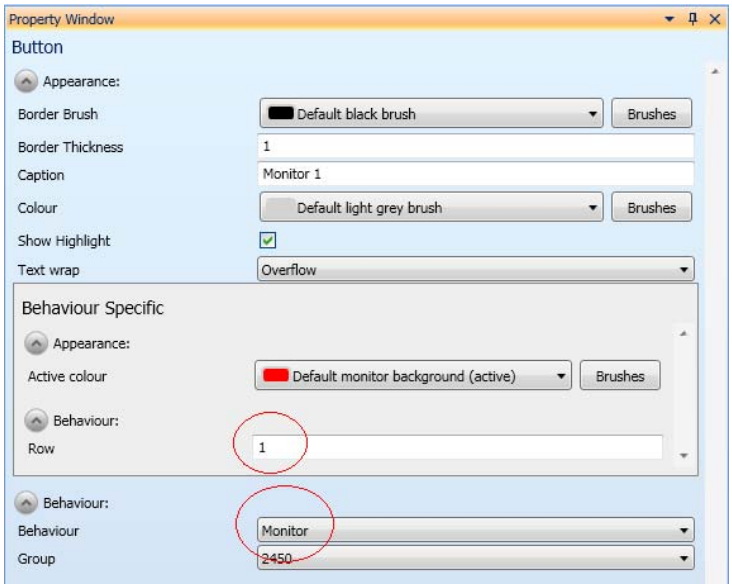

Fig 155. Monitor Button Properties

4. Repeat for up to three further buttons, ensuring that the row is appropriately set for each monitor output.
5. If required, add a text tally using the **Monitor Tally** behavior, and setting the **Row** property to the appropriate monitor number.

A.7.2 Monitoring on an XY Panel

1. Click on a Monitor button.

   The button lights denoting that monitor mode is active.

   If the selected monitor is currently routed to a source or destination the relevant button will light.
2. Click on a Source or Destination button.

   The button selected changes to its Preset color. Only one preset can be active at a time.

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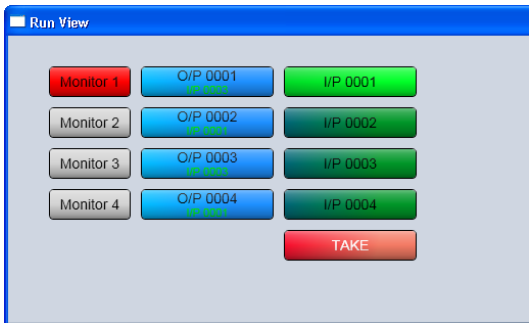

Fig 156. XY Panel Monitor Button Example

3. Click the **Take** button.

   The Preset button changes to Active and the output is visible on the monitor.

   The panel remains in monitor mode until the Monitor button is clicked again.

Note: When in monitor mode, buttons not part of the monitor set (for example, salvos, protect buttons) are ignored.

A.7.3 Monitoring on a Dial-up Panel

Monitor buttons can also be a added to a panel with the **Router Dial Up Behavior**.

When in monitor mode, dial up a source or destination (the current selected one is applied when clicking the **Take** button.

In the following example, clicking Take routes destination 2 to monitor 1.

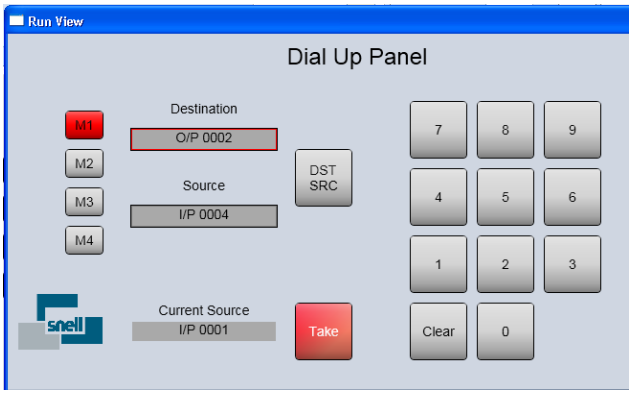

Fig 157. Dial-up Panel Monitor Button Example

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A.8 Destination Follow

It is not possible to use the logical to physical mappings to configure destinations to follow other destinations because additional source / destinations are ignored. However, destinations can be set to follow other destinations with the Generic Editor. See “Generic Editor” on page 94.

Example to set Destination 5 to follow Destination 1:

1. Open Configuration Mode.
2. Select a controller and click **Edit Controller Config...**
3. Select the **Generic** tab and click **Edit Controller...** The Generic Configuration Editor displays.
4. Navigate to **FollowDestinations**, see Fig 158.

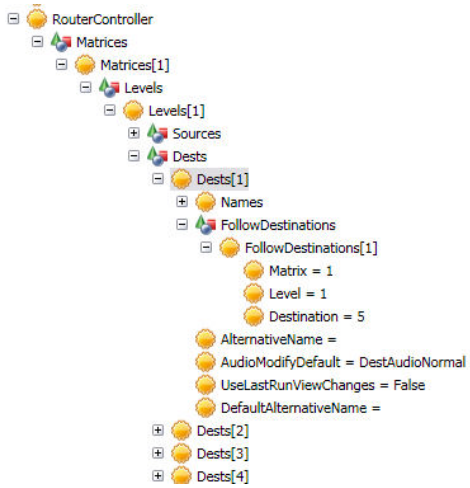

Fig 158. Destination Follow

5. To add an element to the array, click **Add Branch**.
6. Set the **Destination** to 5.
7. Click **Push Branch to Controller**.

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A.9 Configure a MultiViewer

The MultiViewer driver supports the following MultiViewer property-based control and monitoring features:

- Setting captions (UMDs) either in Run mode, or upon a configuration push to the controller.
- Setting a layout either in Run mode, or upon a configuration push to the controller.
- Receiving alarms in real-time in Run mode.

To add a MultiViewer to a controller:

1. Select the controller from the Configuration screen, and click the **Edit Controller Config...** button.
2. From the Devices tab, check the checkbox for a MultiViewerDevice.
3. Open the Generic tab and click the **Edit Controller** button to open the Generic Editor.

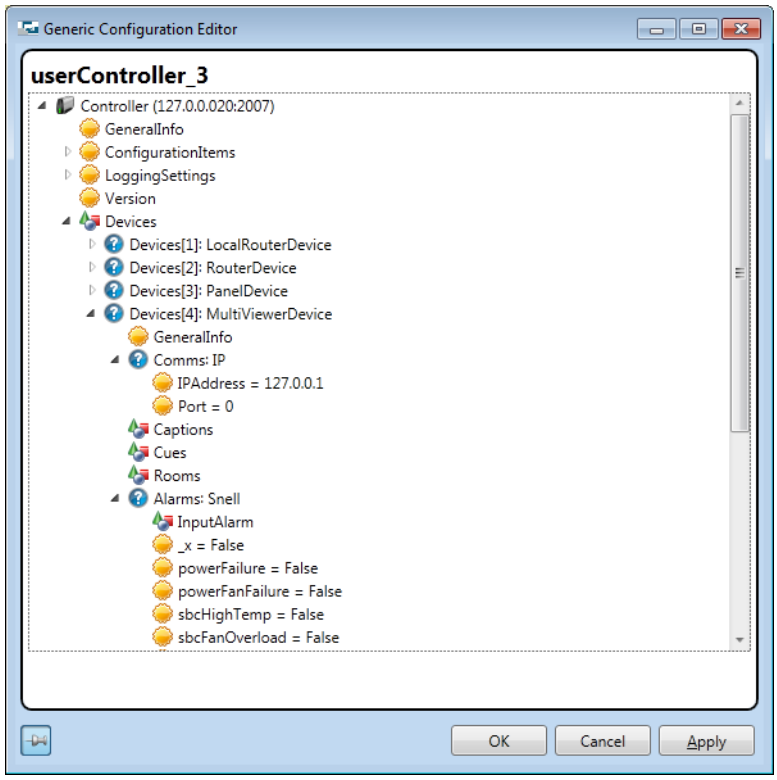

Fig 159. MultiViewer Configuration

4. Under Devices, open the MultiViewerDevice branch.
5. Set the Comms type, either IP or Serial.
6. Set the Alarms type.
7. Define all other alarm settings in the MultiViewer branch as required.

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A.10 Audio and Video Routing and Processing

Standard screens have been included for the provision of routing and processing video with embedded audio, and discrete audio signals. These screens can be adapted or recreated in the normal manner, as necessary for a particular router.

Note: A valid license is required and must be installed for Audio Processing.

The 246x controller on the router must first be configured. See “Configuring Controllers” on page 48.

The Main Menu screen provides access to the routing and processing screens.

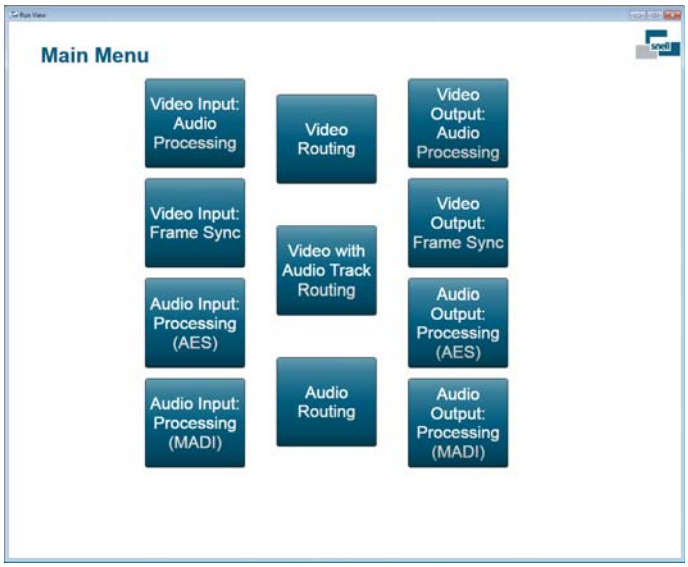

Fig 160. Main Menu

Click on any of the boxes in the Main Menu to go to the appropriate screen:

- **Video Input: Audio Processing**—apply delay, gain, mix channels, and shuffle channels on the de-embedded audio
- **Video Input: Frame Sync**—synchronize input video to a specified reference at a particular standard, or add a delay
- **Audio Input: Processing (AES)**—apply gain and select stereo mode
- **Audio Input: Processing (MADI)**—apply gain and select stereo mode
- **Video Routing**—XY routing of video
- **Video with Audio Track Routing**—XY routing of video with routing of audio tracks onto the video for embedding
- **Audio Routing**—XY routing of audio channels
- **Video Output: Audio Processing**—mix channels, shuffle channels, apply gain, and delay on the audio prior to re-embedding.
- **Video Output: Frame Sync**—synchronize output video to a specified reference at a particular standard, or add a delay.
- **Audio Output: Processing (AES)**—apply sample rate conversion, delay, gain and select stereo mode
- **Audio Output: Processing (MADI)**—apply sample rate conversion, delay, gain and select stereo mode

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To return to the Main Menu from any of these screens, click on the **Menu** button at the bottom left of each screen.

The Video Routing and Audio Routing screens can be accessed directly from each other without the need to return to the Main Menu.

A.10.1 Audio Processing

Note: Audio processing is live, so any changes to the audio are immediately applied. However, mixed channels are not apparent until they are shuffled.

Within all processing screens, the selectable processes display at the top of each screen.

A.10.1.1 Dial-up Keypad

For each of the screens, use the dial-up keypad on the left of the screen to select the signal for processing (either video with embedded audio, or discrete audio).

Fig 161. Dial-up Keypad

When using the video input and output screens, additional mnemonics buttons display to allow for quick dial-up of named sources/destinations. These buttons can be further defined in Design mode.

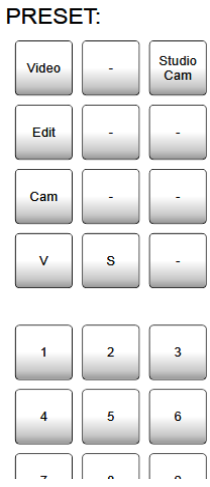

Fig 162. Mnemonic Keypad

Note: If both the upper and lower text fields have been entered when setting up the mnemonic buttons, the upper text is used for the first press in a sequence, and the lower text for remaining button presses in the same sequence.

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A.10.1.2 Shuffling

The shuffling controls are used to replace existing embedded audio channels on a video stream with audio channels from the mixer or from a discrete audio stream. Also existing embedded channels may be reorganized.

The output channels Ch 1 to Ch 16 display in columns across the screen. Within each channel column an input channel is selected via a radio button. Each output channel can have only one input. However, an input can be output to a number of channels, if required.

Before selecting the input channel, the audio type must be defined, for example, embedded.

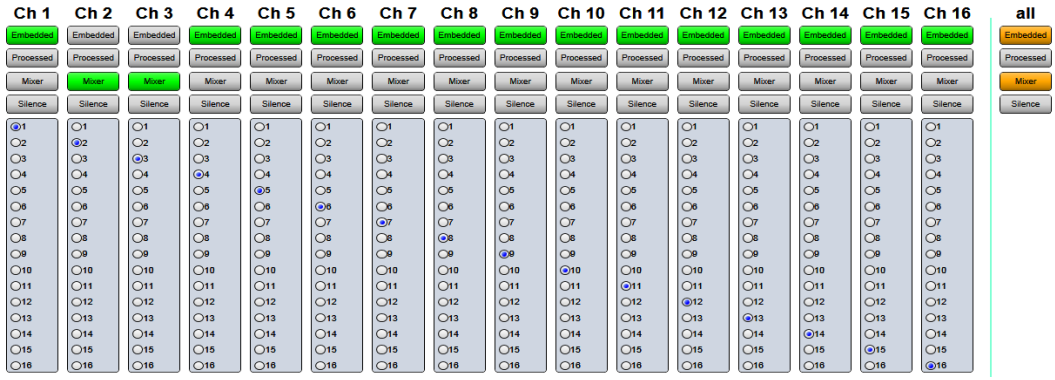


Fig 163. Shuffling Controls

To shuffle a channel:

1. Click on the appropriate audio type button of a channel. See Table 40.
2. Click the radio button for the number of the audio channel to shuffle to:

Source Audio	Destination Audio
Embedded	Embedded
Processed	Audio Xpt
Mixer	Mixer
Silence	Silence

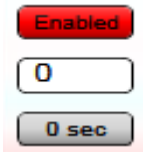
Table 40. Shuffle Audio Types

Note: All channels may be selected/deselected by clicking on the relevant button under All.

A.10.1.3 Delay

To add a delay to a channel:

1. Click on the **Enabled** button.
2. Enter a delay value in seconds.



To set the delay back to zero:

- Click on the **0 sec** button.

To disable the delay:

- Click again on the **Enabled** button.

Note: All channels may be enabled/disabled, or set to zero seconds by clicking on the relevant button under All.

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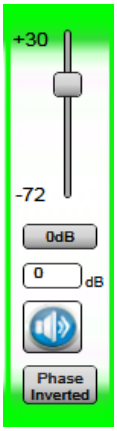
A.10.1.4 Gain

To alter the gain of a channel, either:

- Type a gain value directly into the numeric box, or
- Move the slider for coarse control - 1 dB increments/decrements
- Fine-tune with the up and down arrow keys - 0.1 dB steps (Mixer screens only)
- To return to 0 dB, click the **0 dB** button (or **Unity** button in the Mixer screens)



Other processing in the Gain screen:

- Mute the source by clicking the Mute button ( ).
- Invert the phase by clicking on the **Phase Invert** button.

Note: All channels may be selected/deselected for 0 dB gain, Mute/Un-mute, or Phase Invert/Normal by clicking on the relevant buttons under All.

A.10.1.5 Mixing

Mix audio channels prior to shuffling.

For embedded audio there are 16 mixers each of which can mix-down up to 16 channels into a single audio channel.

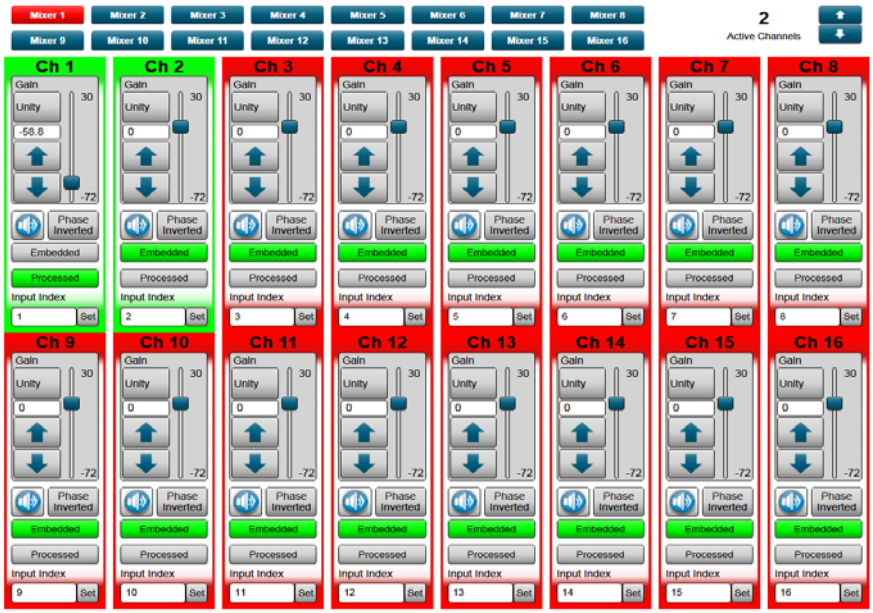


Fig 164. Mixing Controls

1. Click on a Mixer button at the top of the panel.
2. Using the up and down arrow keys at the top right of the panel define the number of channels to mix down.

Note: Configure the channels to mix-down starting with Ch 1, Ch 2 and so on without leaving any gaps. For example, if mixing-down six channels, ensure that these channels are set up on Ch 1 to Ch 6.

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3. Click the appropriate button to set where the audio source is coming from. See Table 41.
4. Set the channel number in the Input Index box, and click **Set**.
5. If required, apply processing to each of the channels in the same way as in the Gain screen. See “Gain” on page 164.

Source Audio	Destination Audio
Embedded	Embedded
Processed (Gain applied)	Audio Xpt
	Off

Table 41. Mixer Audio Types

A.10.1.6 Stereo Mode

For AES and MADI inputs and outputs, the stereo pairings can be adjustment using the relevant buttons on the audio processing screen:

LR Swap	Swap the left and right channels of a stereo pair
Left Both	The left channel of a stereo pair is duplicated for both channels
Right Both	The right channel of a stereo pair is duplicated for both channels
Mono Mix	The two channels are mixed down to a mono channel
Normal	Standard left and right channel pairing

A.10.1.7 Sample Rate Conversion

Sample Rate Conversion (SRC) allows the sample rate of audio from the audio crosspoint to be converted to a different sample rate either, asynchronously, or synchronously to an input reference.

For example, sample rate conversion might be used when audio has been recorded on Mini Disc at 44.1 kHz and it needs to be converted to 48 kHz for broadcast.

Note: A separate valid license is required and must be installed for Sample Rate Conversion.

SRC Setup

1. Select the SRC Rate from the drop-down list.
2. Select the SRC Reference from the drop-down list, if required.

   The reference can be any of the video references or an AES reference.
3. Check the SRC Enable checkbox.
4. Check the Use SRC checkbox. On AES audio screens check the appropriate Use SRC checkboxes for each of the appropriate stereo audio pairs.

SRC Operation

- **AES** - Sample rate conversion is applied to groups of eight audio pairs rather than individual channels. All selected pairs in the group will be synchronous to each other and output at the same selected sample rate. Deselected pairs will pass through with their sample rates unchanged.
- **MADI** - Sample rate conversion is applied to all pairs in the MADI output stream rather than individual channels. All pairs in the MADI stream will be synchronous to each other and output at the same selected sample rate.

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- Channels within a pair must be the same initial sample rate and synchronous to each other. If they are asynchronous to each other then sample drop or repeat is used on the right channel to match the left channel.
- Pairs within an AES group or MADI output stream can be asynchronous to each other and can be different sample rates to each other when they enter the sample rate conversion process.
- The output from the sample rate conversion can be locked to the AES reference input or one of the four physical video reference inputs.
    - If no reference signal is present on the selected reference input, all the SRCs on output using that reference input will be free running and locked together. They will not be locked to the free running SRCs on the other outputs that are using the same reference.

Dolby Signals

- Dolby signals must be routed as a synchronous AES pair. The Dolby signal will automatically bypass the SRC even if the pair is selected for sample rate conversion. Any reference locking is achieved by dropping or repeating Null samples in the guard band.

Reference lock only mode

- A group of pairs or a MADI stream can be locked to the AES reference or one of the four physical video reference inputs without sample rate conversion being enabled.
    - If no reference signal is present on the selected reference input, all the SRCs on output using that reference input will be free running and locked together. They will not be locked to the free running SRCs on the other outputs that are using the same reference.

Note:

AES - If channels within a pair are asynchronous to each other then sample drop or repeat is used on the right channel to match the left channel.

MADI - If channels from the audio crosspoint are asynchronous to each other then sample drop or repeat is used on all channels to match the first active channel in the MADI stream.

SRC straight through mode

- If an AES pair doesn't have sample rate conversion enabled and doesn’t have a reference selected then that pair will be output at the same sample rate as the left channel of each pair. In the case of a MADI stream all of the pairs will be output at the same sample rate as the first active channel of the MADI stream. For example, this method can be used to pass Varispeed MADI.

Note:

The maximum sample rate that can be input to the SRC in straight through mode is 50 kHz.

AES - If channels within a pair are asynchronous to each other then sample drop or repeat is used on the right channel to match the left channel.

MADI - If channels from the audio crosspoint are asynchronous to each other then sample drop or repeat is used on all channels to match the first active channel in the MADI stream.

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A.10.2 Frame Sync

Synchronize or delay video on input or output to a specified reference at a particular standard.

Note: A separate valid license is required and must be installed for Frame Sync.

The Frame Sync screen indicates the standard detected on the current signal.

Setup as many frame synchronizations or delays as required, selecting the relevant tabs. On the input frame sync screen a Summary tab (and separate button) is available which, when selected (clicked) displays an overview of the current frame sync configuration for all standards.

To setup frame synchronization for a specific standard:

1. Select the relevant standard from the tabbed pages.

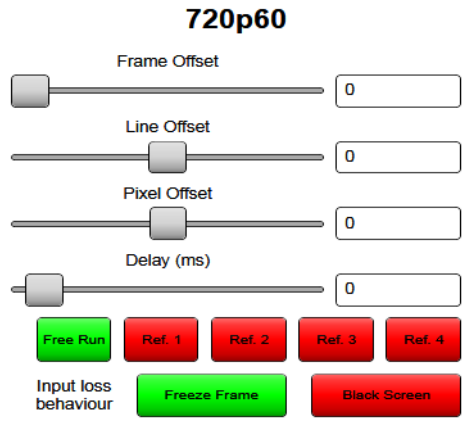

Fig 165. Frame Sync Setup

2. Choose an input reference to synchronize to, or allow to Lock to Input (Delay).

Note: The input reference must have the same frame rate as the frame sync to synchronize to.

3. Select **Freeze Frame** or **Black Screen** as the action to take in case of data loss.
4. Define the offset, Frame, Line and Pixel (pixel only if synchronizing by line), or by a delay (in milliseconds), as required.

   The available offsets differ according to the standard being setup.

To enable frame synchronization:

1. Determine if the synchronization is to be performed by **Frame** or by **Line**, by clicking on the relevant button.
2. Select the Audio:

   Pre - the audio will not be synchronized

   Post - the audio is synchronized along with the video
3. Click on the **Frame Sync Enabled** button to turn it green.

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A.10.3 Routing

All audio whether embedded, or discrete (AES or MADI), is considered as mono channels for processing, and all can be routed independently of, or with, video.

Routing of audio can be performed as follows:

Source	Destination
Audio embedded in video	Audio embedded in video
Audio embedded in video	Discrete AES audio
Discrete AES audio	Audio embedded in video
Discrete AES audio	Discrete AES audio

Table 42. Possible Audio Routes

A.10.3.1 Audio Routing

Route audio channels using a standard XY panel.

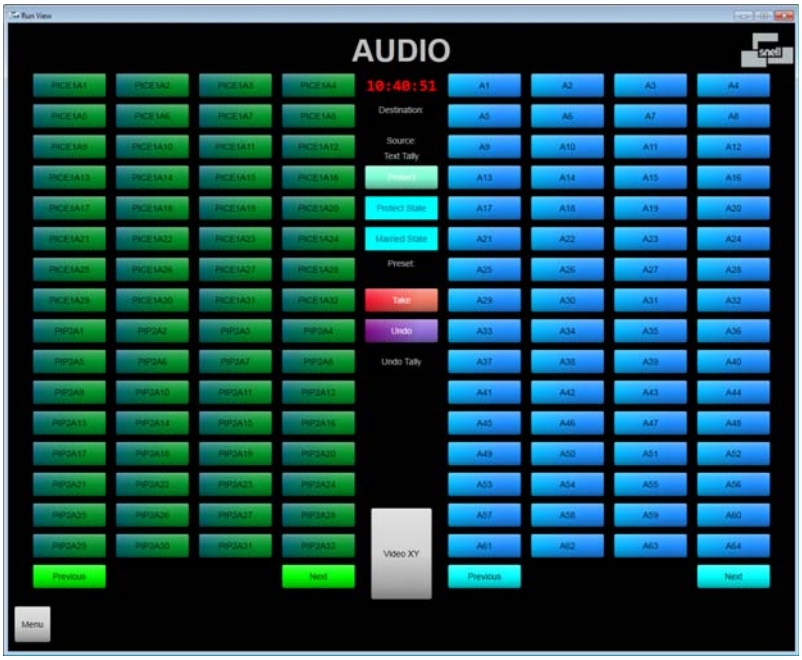

Fig 166. Audio Routing

To navigate directly to the Video Routing screen:

- Click on the **Video XY** button.

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A.10.3.2 Video Routing

Route video using a standard XY panel.

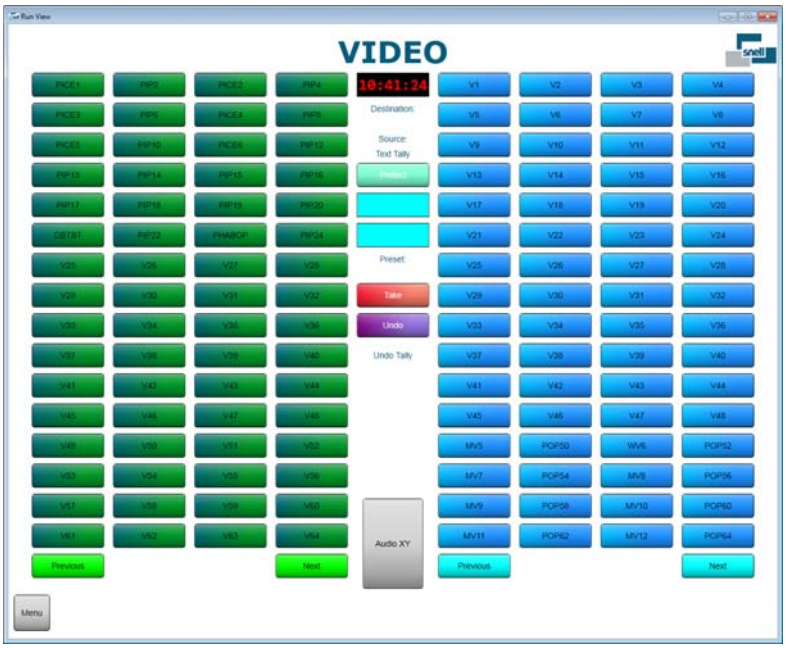

Fig 167. Video Routing

To navigate directly to the Audio Routing screen:

- Click on the **Audio XY** button.

A.10.3.3 Video with Audio Track Routing

Route audio tracks onto video, so that the new audio is embedded into the video on output.

Fig 168. Video with Audio Track Routing

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To route audio tracks onto video:

1. Select a destination.

   The In Use tally displays the current audio track selection.

2. Select a new source.
3. Click on the **Track Preset** button.
4. Click the button for the destination audio track.
5. Click the button for the source audio track.

   The Preset tally indicates the audio selected for the destination track.

6. Repeat steps 4 and 5 until all audio tracks required are setup.
7. Click on the **Take** button.
8. The audio sources are routed to the destination.

A.11 Audio Reference

A controller can be configured to distribute an AES reference around the router so that the audio output cards can lock to it. The AES reference generated is either a free-running clock set to a selectable AES clock rate, or it can be locked to a physical input reference on the router (either of the incoming AES references, or one of the video references).

To lock to an internally generated reference the Generic Configuration Editor is used. For all controllers the audio reference controls are in the BaseReference section of ReferenceControl branch. See Fig 169. for an example where the ReferenceControl is situated in a 246x controller tree. For a 2450 controller the ReferenceControl is under the Config2450 branch.

Note: Changes to any of these configuration values will require a push to the controller.

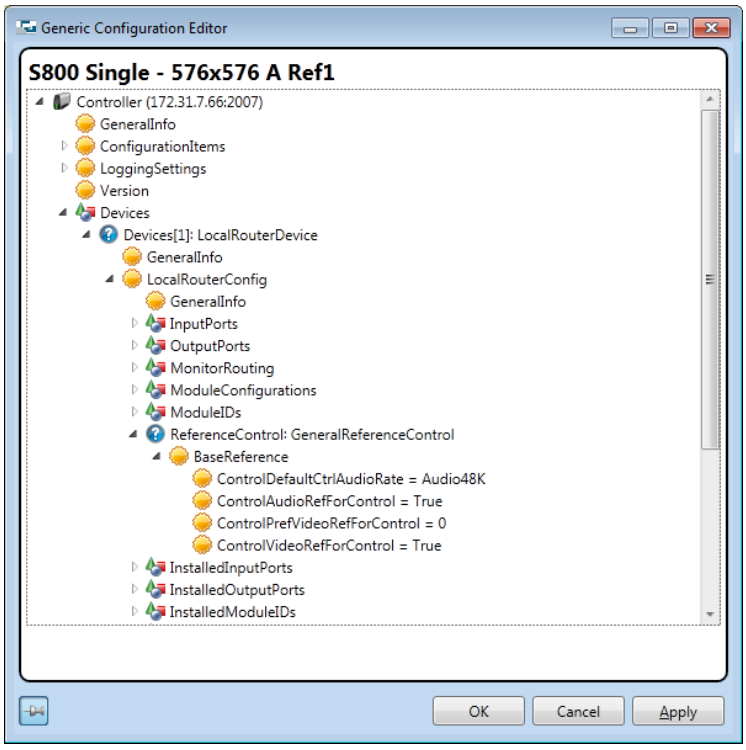

Fig 169. Audio Reference Configuration

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The fields for configuring the reference control are:

ControlAudioRefForControl	Controls whether the reference is set to that of the incoming AES reference (True - default), or not (False). If the incoming AES reference is invalid, or not present) the reference is set to free-run at the **ControlDefaultCtrlAudioRate**.
ControlVideoRefForControl	Controls whether the reference is set to that of the incoming video reference (True - default), or not (False). If the incoming video reference is invalid, or not present) the reference is set to free-run at the **ControlDefaultCtrlAudioRate.**
ControlPrefVideoRefForControl	Sets which video reference is used (0=video reference 1, 1=video reference 2 and so on.
ControlDefaultCtrlAudioRate	Defines the default audio rate for when a free-running reference is set. Valid rates are 32k, 44.1k, 48k, 88.2k, 96k, 176.4k and 192k

Note: If both **ControlAudioRefForControl** and **ControlVideoRefForControl** are set to **True** then the **ControlAudioRefForControl** takes precedence.

A.12 Logging Configuration

Logging is configured through the Generic Editor.

1. Open Configuration Mode.

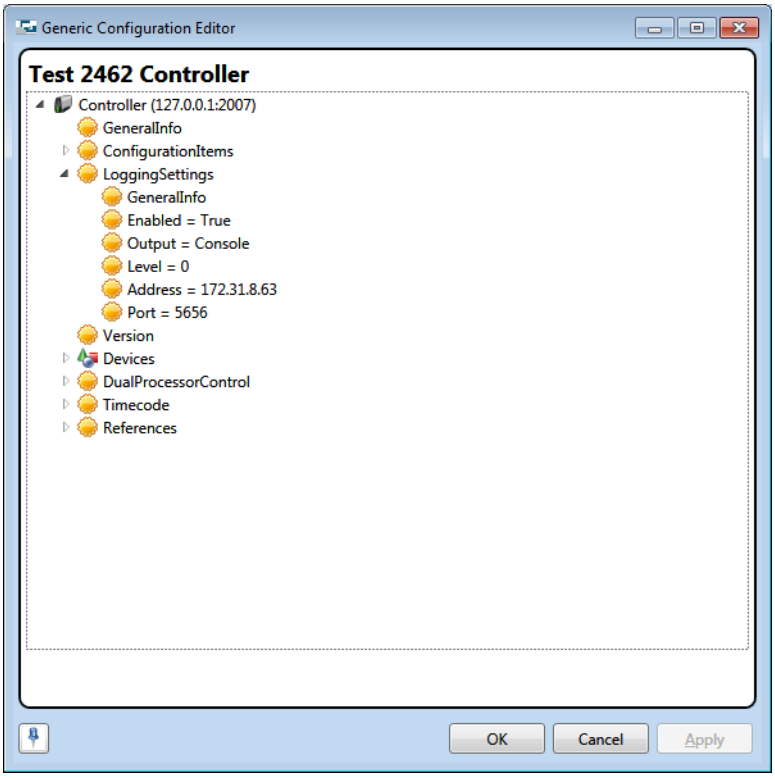

Fig 170. Logging Configuration

2. Select a controller and click **Edit Controller Config...**

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3. Select the **Generic** tab and click **Edit Controller...** The Generic Configuration Editor displays.

4. Expand the controller branch.

5. Depending on the controller used, expand either the **LoggingSettings** branch, or the **ConfigurationItems > Logging** branch, and set the following parameters:

   - Enabled - True to enable logging output.

   - Output - UDP or Console (UDP logging is recommended)

     On a Centra Controller, enabling Console sends all log information to the monitor, via VGA on 2330, or HDMI on 246x controllers.
     The 2450 controller does not have a VGA output so selecting Console sends log messages to serial port COM1. This can be monitored using a terminal emulator configured to 9600 baud, 8 data bits, 1 stop bit, no parity.

     Logging to the console can cause problems on the controller when setting multiple crosspoints. This is because crosspoint log messages are quite large, so setting multiple crosspoints results in the output queue filling up which causes the Nucleus controller to stall waiting for space in the queue. This was addressed in release 1.1.7 (Workbench V3.10) by restricting log messages sent to the console to be warning (level 4) or above (DCCP-265). Earlier versions should either not enable logging to the console, or manually set the Level parameter to 4.

Note: COM1 is not available externally to Sirius 800 routers.

   - Level - Minimum level of messages to log (0 - 6). Setting to zero means every log event is recorded.

     The level numbers correspond to the following:

     0: Debug
     1: Trace
     2: Verbose
     3: Information
     4: Warning
     5: Error
     6: Fatal error

   - Address - IP address to send log messages to (UDP logging).

   - Port - IP port to send log messages on (UDP logging).

     UDP logging can cause a problem if the log client is not switched on. If logging is enabled and configured to an IP address of a PC which is not switched on, each time a log message is sent, the controller attempts to locate the device using an ARP message. This can cause a delay setting crosspoints if the logging level is set so that a log message is sent every time a crosspoint is set. To prevent this, ensure the log client is running if UDP logging has been enabled.

     Logging information sent on a UDP port can be gathered with the Database Log Pump.

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A.13 Mimic Diagrams

The following example is a simple, single matrix architecture with two video servers as inputs and two multiviewers as outputs. Fig 171. shows the inputs and outputs.

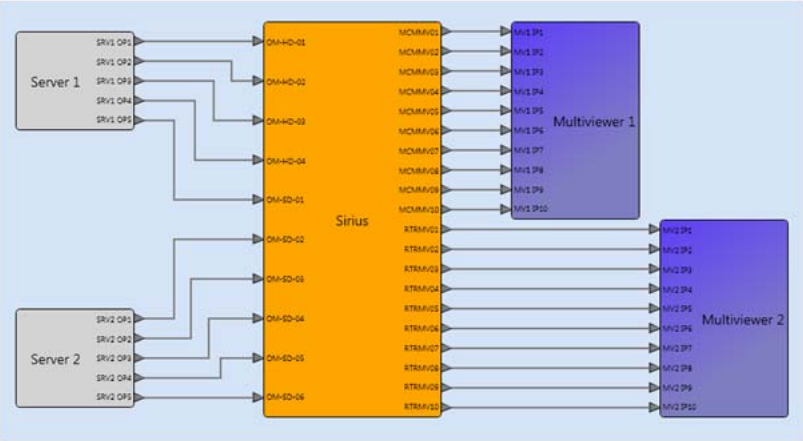

Fig 171. Pin Editor - Mimic

Six re-entrant modular devices are connected to the router, see Fig 172.

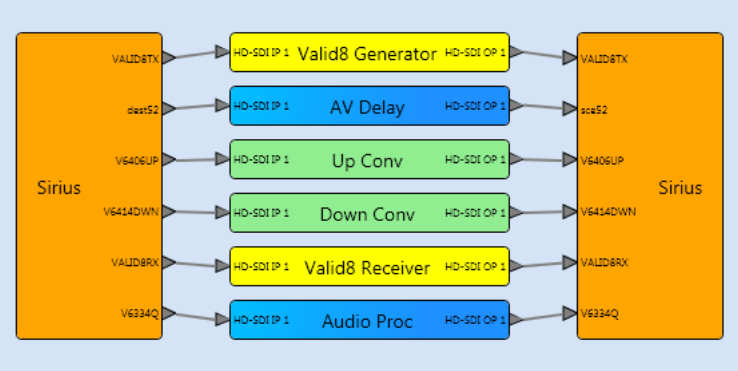

Fig 172. Re-entrant Modular Devices

A.13.1 Inputs

Each of the multiviewer outputs is connected to the router. Each output is set to display individually on the mimic diagram. The mimic tab is used to set up how each pin displays on the mimic.

1. Check the **Show on Mimic** checkbox to display the pin as a block.
2. Enter a category in the edit box to help organise the pins, see Fig 173.

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A.13.2 Outputs

Each of the multiviewer inputs are set up to be outputs of the example system. This is done in exactly the same way as for the server outputs, see Fig 173.

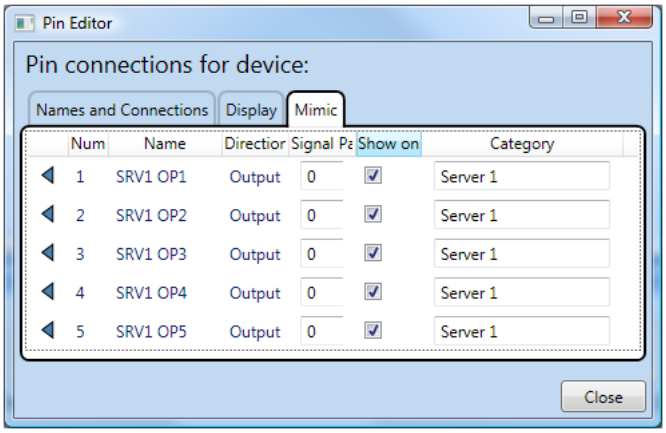

Fig 173. Pin Settings

A.13.3 Router Matrix

The matrix device on the system architecture must also be associated with a matrix within a router controller. This is done via the Property Editor, see Fig 174.

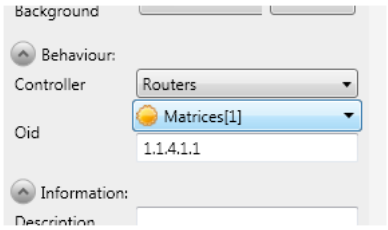

Fig 174. Router Matrix

A.13.4 Re-entrant Devices

The device must be displayed as a block. This is also done via the Property Editor.

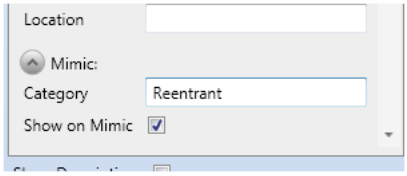

Fig 175. Re-entrant Devices

A signal path must be set up within the device.

Since the modular devices here are not router devices, the mimic requires some information on which pins connect to which. This is done via the Mimic tab in the pins editor, see Fig 175.

For each pin, enter the number of the pin to which it connects. Fig 176. shows the signals that are to be traced from pin 1 and pin 5.

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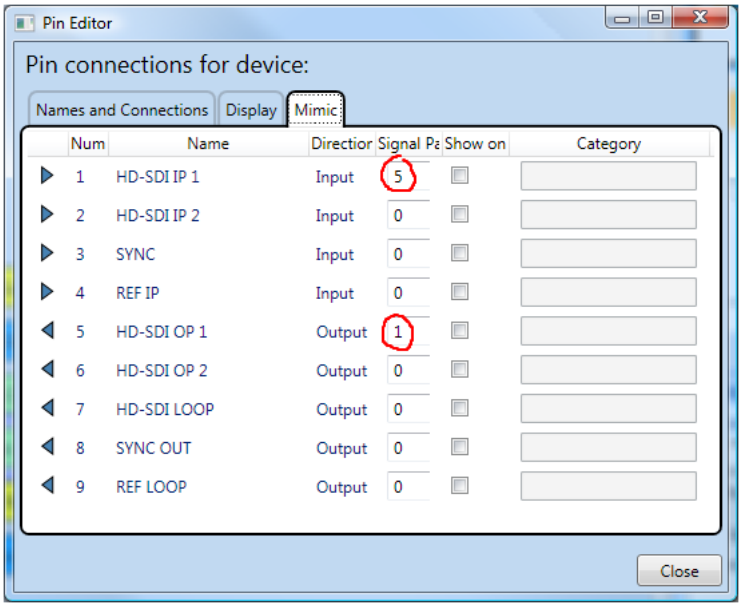

Fig 176. Mimic Pin Settings

A.13.5 Setup a Mimic Soft Panel

To setup a mimic diagram on a soft panel, only two special controls are used: the mimic box and the block selector. All the other controls are standard buttons and labels. Fig 177. shows a completed mimic screen in design mode.

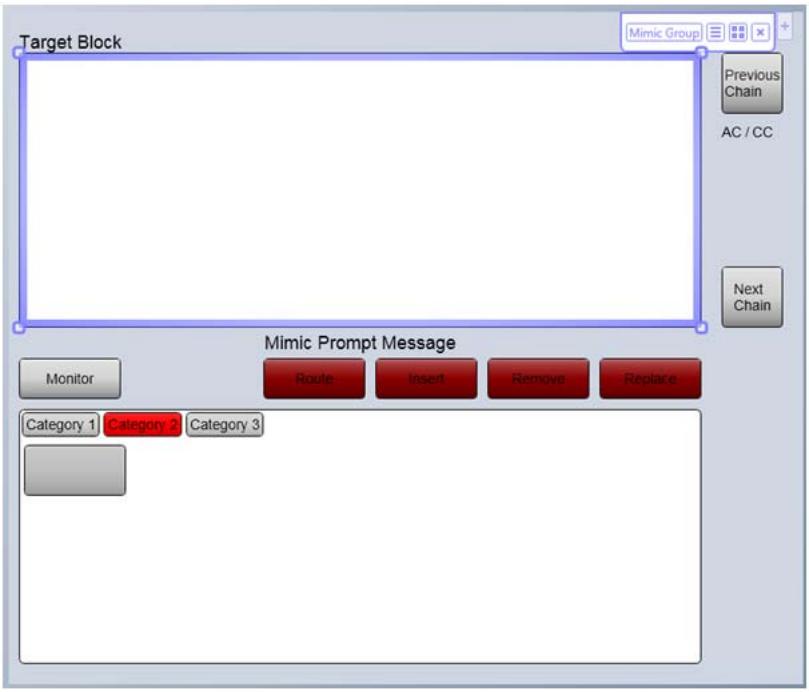

Fig 177. Completed Mimic Screen

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To set up a basic mimic panel:

1. Create a new panel.
2. Create a group and set the group behavior to Mimic Behavior.
3. Set up the group behavior by assigning a tie-lines controller and choosing a monitoring device and input.
4. Add a Mimic box to the panel, ensure it is in the correct group and set the behavior to Mimic Box. Various display options are available in the property editor for this control.
5. Add a Block Selector to the panel and set the behavior to Block Selector. Various display options are available in the Property Editor for this control.
6. Add five buttons to set the mimic mode: Monitor, Route, Insert, Remove and Replace. Set the button text and behavior as appropriate.
7. Add a text label and set the behavior to Prompt Message. This displays instructions. Alter the wording of the messages via the property editor.
8. Add a text label and set the behavior to Target Block. This displays the name of the selected target block.
9. Add buttons for Previous Chain and Next Chain and set the text and behavior properties as appropriate.
10. Add two text labels and set the behaviors to Active Chain and Chain Count. These display the number of chains discovered and the index of the currently active chain.

Setup of the mimic diagram is complete.

A.14 RollCall Screens

When a RollCall Gateway controller has been configured, a screen can be designed to control and monitor devices on the RollCall network.

1. Create a screen and add a Generic behavior group to the default panel.
2. Assign the RollCall controller as the group's controller setting.
3. Add a label to the panel.
4. Set the label's behavior to DCCP behavior.
5. Set the label's OID property to a property underneath the Frames node of the controller configuration.
6. Save the screen and run it to see the results.

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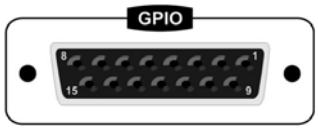
A.15 GPI Overrides

When a hardware control panel is in one of the BPX modes it includes a joystick override feature that allows the GPI to be used as inputs.

A.15.1 GPI Ports on a Panel

The15-way D-type connector on the rear of a hardware control panel provides opto-coupled GPI ports.

Pin	Function	Pin	Function
1	GPIO1	9	GPIO9
2	GPIO2	10	GPIO10
3	GPIO3	11	GPIO11
4	GPIO4	12	GPIO12
5	GPIO5	13	+5 V 0.2 A (current limited)
6	GPIO6		
7	GPIO7	14	GND
8	GPIO8	15	GND



Note: When using a 2330 or 2450 controller, or non-IP hardware control panels, only ports 1 - 8 are available.

A.15.2 Configuring GPI Overrides

When configuring a hardware panel in Design mode:

1. Select the Panel Properties, and click on the **Advanced** button in the Panel Type Specific section.

   The Advanced Panel Configuration screen displays.

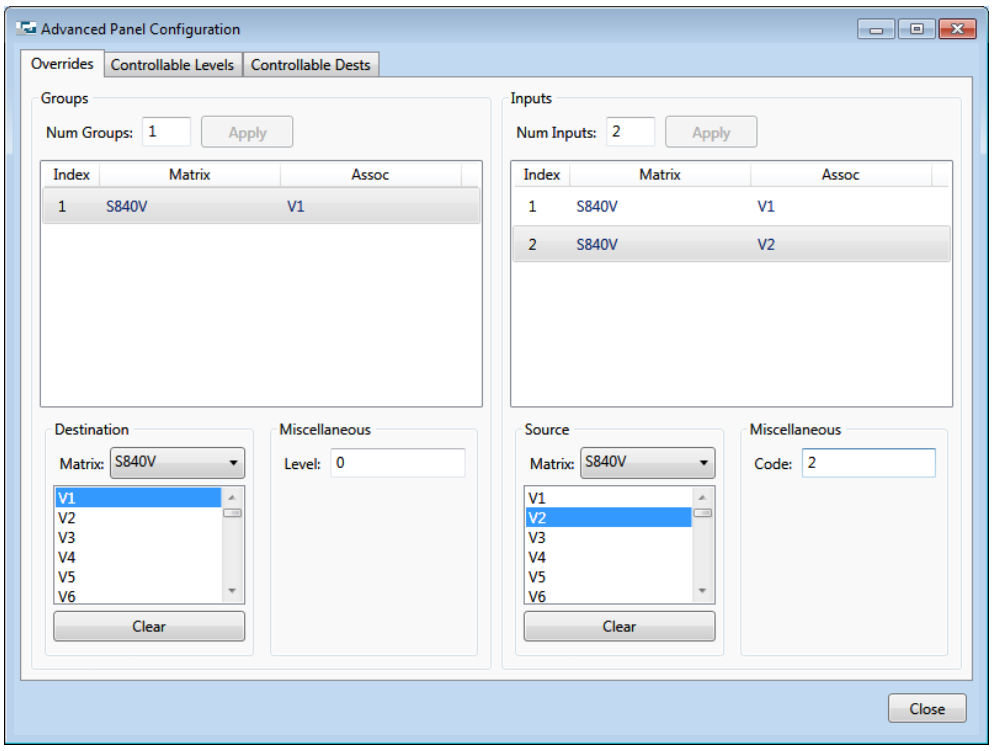


Fig 178. Example GPI Override Setup

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2. Define a number of groups, and click on the **Apply** button (in this example, “1”).

   Groups allow GPIs to be allocated together, or separately, as desired.

   For example: a single group may contain a number of GPIs that route sources to one destination on a single matrix, or a number of groups each with one GPI controlling a different input to a different output, or, any combination in between.

3. Select a group to highlight it for editing.

4. Click on the Matrix drop-down list and select a matrix.

5. Select an output from the list of destinations.

A.16 Set Controller Dual Redundancy Over IP

To enable remote changeover of dual controllers over IP, the IP port configuration must be configured.

Note: This is relevant for Centra Controllers only. 2450 controllers are set up using the configuration files.

1. From the Configuration screen, edit the primary controller, and select Router Configuration.

2. Click on the **Port configuration** button.

3. Add a new port, and configure it as an IP port, using the SW-P-02 protocol.

4. Set the Controller type to Centra Controller.

5. Set Single/Dual mode to Dual.

6. Define the primary and secondary IP addresses.

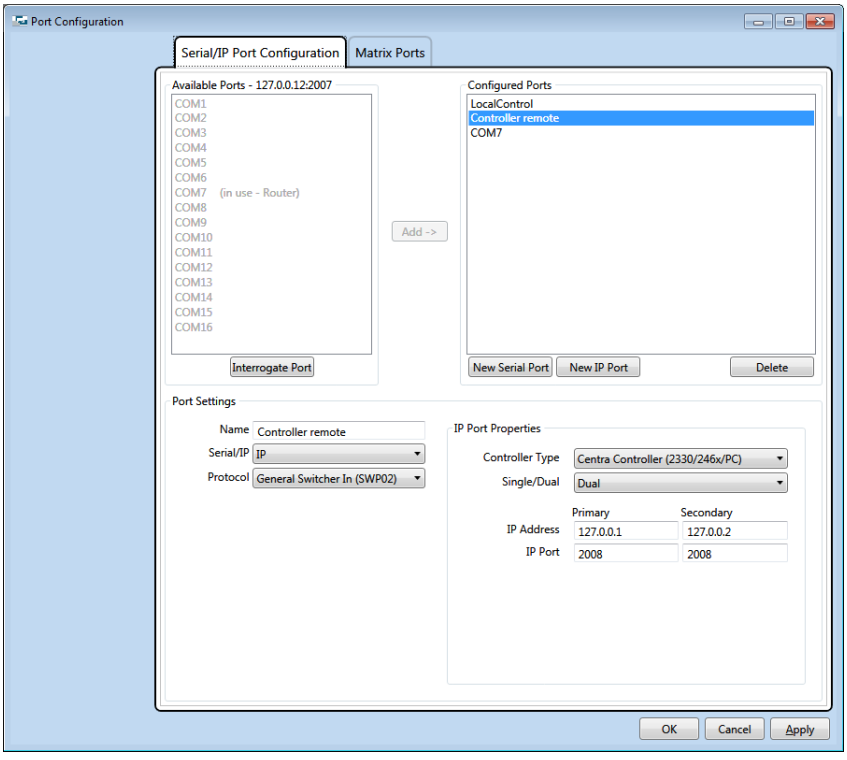

Fig 179. Port Configuration Example

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7. Click on the Matrix Ports tab.
8. Select the Video level, and click on the **Add Port** button.
9. Select the port just defined from the drop-down list in the Port: box.
10. Edit the End Dest: to match that used in the LocalControl port.

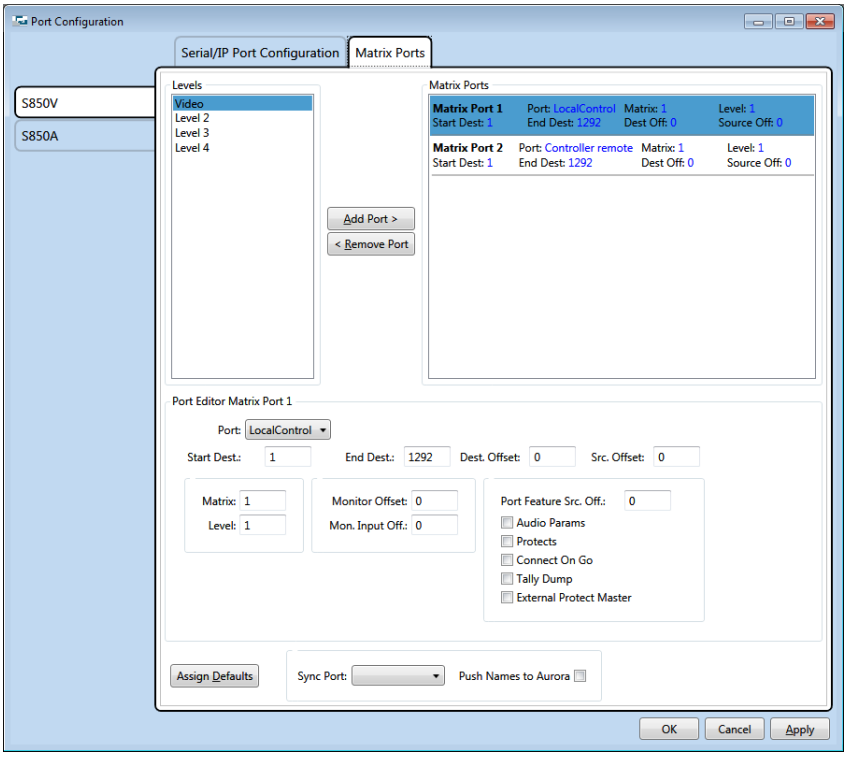

Fig 180. Matrix Ports Example

A.17 Set up Tie-lines

In this example, two single level matrices are already setup, and a 2330 controller is used as a tie-line controller for three tie-lines between the routers.

A.17.1 Set up a Tie-line Controller

1. From the Configuration screen, add a new blank Centra controller.
2. Edit the controller, and add a TielinesDevice.
3. Click on the **Configure Devices** button.
4. Click on the **Edit Tie Lines...** button.
5. The Tie Lines Editor screen displays.

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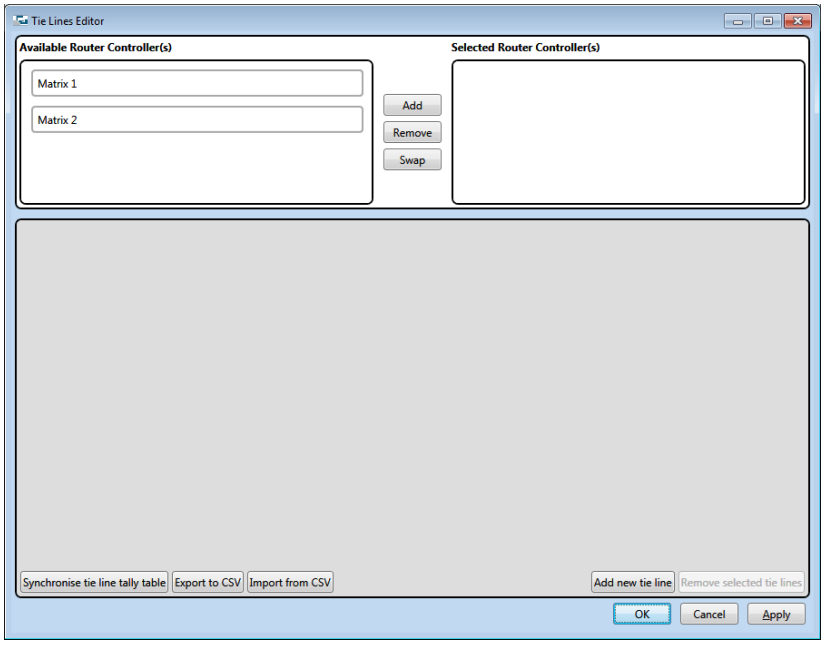

Fig 181. Tie Lines Editor

6. Select a controller and click on the **Add** button. Repeat for the second controller.
7. Click on the **Add new tie line** button.
8. Enter a Name, Group and Owner for the tie-line.

Note: The Owner field is used to link tie-lines to specific soft panels. See “Assign Specific Tie-lines to the Soft Panel” on page 182.

9. Select the Start and End point for the tie-line from the drop-down boxes.
10. Add a second and a third tie-line, and repeat.

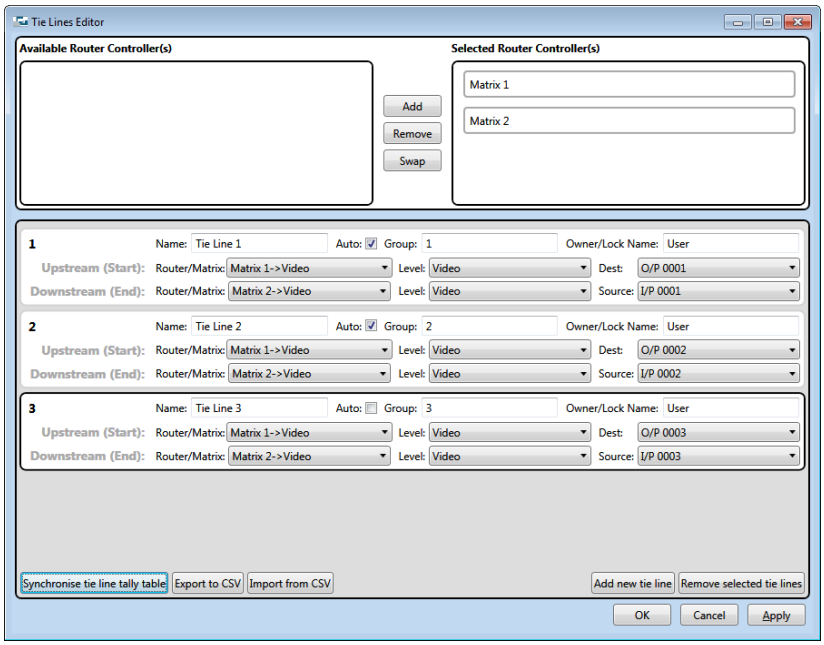
Tie Lines Editor
Available Router Controller(s)
Selected Router Controller(s)
Matrix 1
Matrix 2
Add
Remove
Swap
1 Name: Tie Line 1 Auto: Group: 1 Owner/Lock Name: User
Upstream (Start): Router/Matrix: Matrix 1->Video Level: Video Dest: O/P 0001
Downstream (End): Router/Matrix: Matrix 2->Video Level: Video Source: I/P 0001
2 Name: Tie Line 2 Auto: Group: 2 Owner/Lock Name: User
Upstream (Start): Router/Matrix: Matrix 1->Video Level: Video Dest: O/P 0002
Downstream (End): Router/Matrix: Matrix 2->Video Level: Video Source: I/P 0002
3 Name: Tie Line 3 Auto: Group: 3 Owner/Lock Name: User
Upstream (Start): Router/Matrix: Matrix 1->Video Level: Video Dest: O/P 0003
Downstream (End): Router/Matrix: Matrix 2->Video Level: Video Source: I/P 0003
Synchronise tie line tally table
Export to CSV
Import from CSV
Add new tie line
Remove selected tie lines
OK
Cancel
Apply

Fig 182. Tie Lines Added

11. Click on the **Apply** button.

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A.17.2 Configure a Safe Source

A safe source (or park channel on RS422 router) is set up in the Generic Editor.

1. Select the Tie-line controller from the Configuration screen, and click on the **Generic Editor...** button.

2. Navigate to the Safe Source parameter, as indicated in Fig 183.

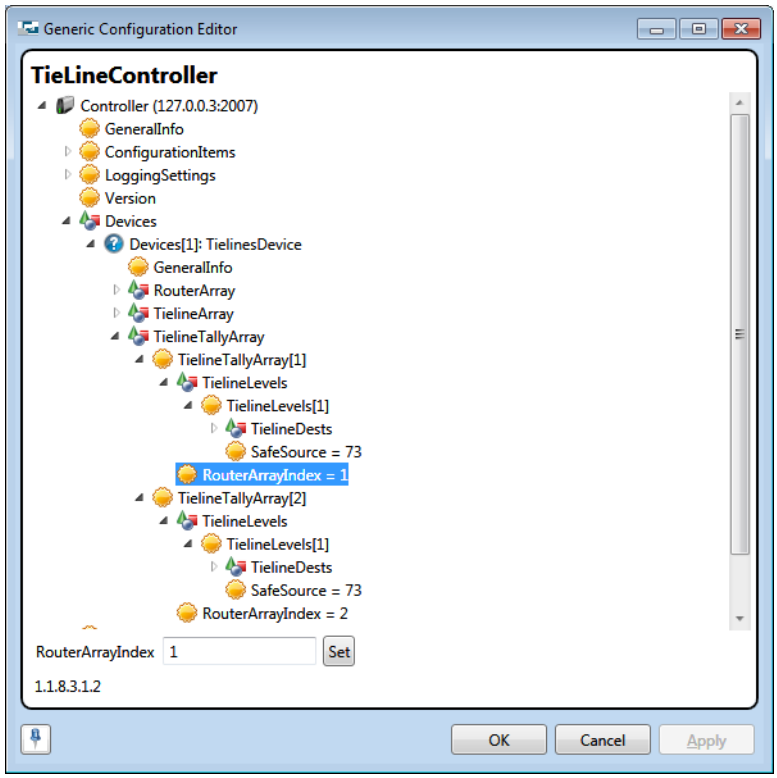

Fig 183. Safe Source

3. Click on the Safe Source parameter, and enter a port value in box at the bottom of the Window.

4. Click Set.

5. Repeat for the second safe source, and click **OK**.

A.17.3 Configure a Soft Panel for Tie-lines

The soft panel will require four groups, one for each of the three controllers, and a miscellaneous one for label, lines, etc.

The following behaviors should be assigned to each group:

Group	Behavior	Group Content
Matrix 1	Router XY	Standard router XY on Matrix 1 controller, with text tallies on the Tie-line management section indicating tie-line output ports
Matrix 2	Router XY	Standard router XY on Matrix 2 controller, with forward tallies in the Tie-line Management section indicating tie-line input ports
Tie-line	Multi-Matrix	Source and destination buttons in the Multi-Matrix section, and Clear Tie-line buttons in the Tie-line Management section
Miscellaneous	Passive	Lines, labels and backgrounds that don't point to a controller

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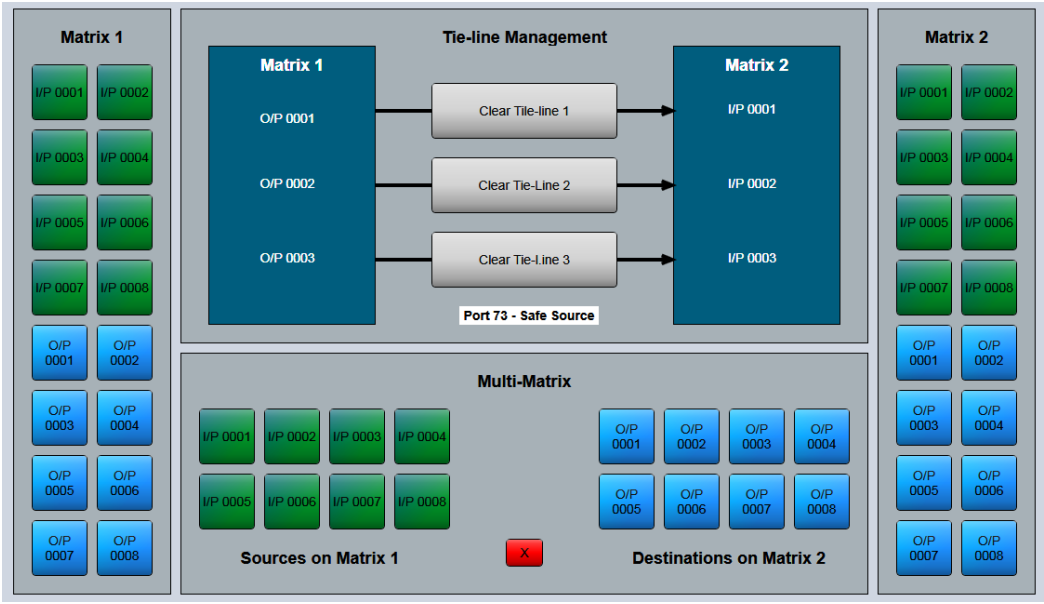

Fig 184. Example Tie-lines Soft Panel

A.17.3.1 Assign Specific Tie-lines to the Soft Panel

In the soft panel used for managing the tie lines, a link must be made to the relevant tie-lines setup in the Tie-line Editor screen.

- Using the soft panel example in the next section as a guide, set the Locked parameter to the Owner/Lock name setup in the Tie Line Editor screen.

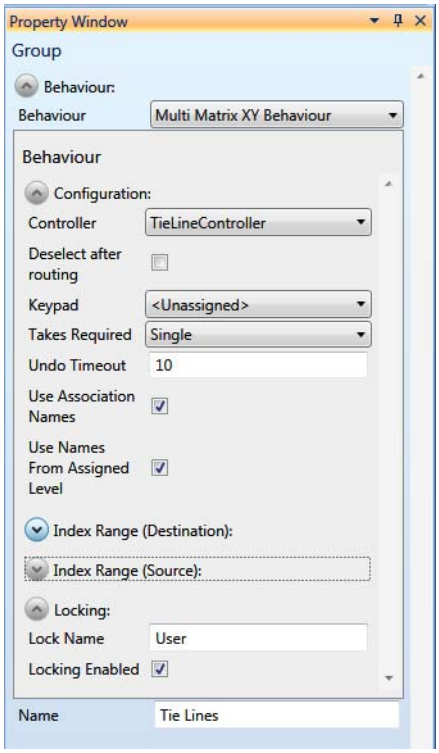

Fig 185. Group Behavior

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A.18 Router Follow

The source or destination selection of a group can be configured to follow the source or destination selection of one or more other routing groups.

For example, an Audio Processing behavior may be configured to follow the source or destination selection of a Router Dial-up behavior.

When a source or destination on a routing group changes, any following groups automatically change accordingly.

Note: The followed groups reflect the change immediately if the followed group is on the same screen, or reflect the change at the point when a screen containing the followed groups displays.

To set up a router follow:

1. Open the Group properties of a router screen.
2. Click on the Follow Selection **Configure...** button.

   The Follow Selection screen displays.

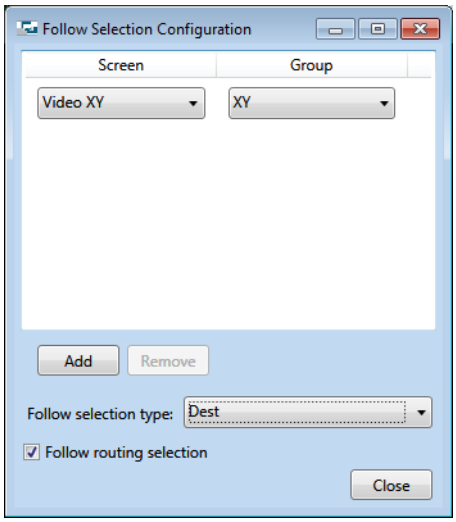

Fig 186. Router Follow

3. Click on the **Add** button.

   A new configuration row is added in the main area of the screen.
4. In the new configuration row, select a router screen to follow, from the Screen drop-down list.
5. Select the group on that screen to follow, from the Group drop-down list.
6. Determine whether it is sources, destinations, or both, that re to be followed. Select from the Follow selection type drop-down list.
7. Check the Follow routing selection checkbox.

Note: Unchecking the Follow routing selection checkbox allows the router follow to be left configured without actually following the router.

To remove a router follow:

- Select the row to remove (click on the area outside of the drop-down lists), and click on the **Remove** button.

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A.19 Configure Dynamic UMDs

To configure dynamic UMDs to follow tie-line routes, a minimum of two controllers are required, configured for the following devices:

- A Router device
- A Tie-lines device
- A UMD Engine device
- A UMD Driver device

A.19.1 Configure the Controllers

In this example two controllers are used to configure the devices. More controllers may be used if required.

Note: At least two 2330/246x/PC controllers are required, as a Tie-line device cannot be on the same controller as a Router device. Similarly, a UMD engine cannot be on the same controller as Tie-line device, or a UMD device.

Controller 1 - Router and UMD Engine

1. Add a controller, and configure it as a Router device.
2. From the Devices tab in the Controller Configuration screen, add the UMDEngineDevice to the controller configuration.

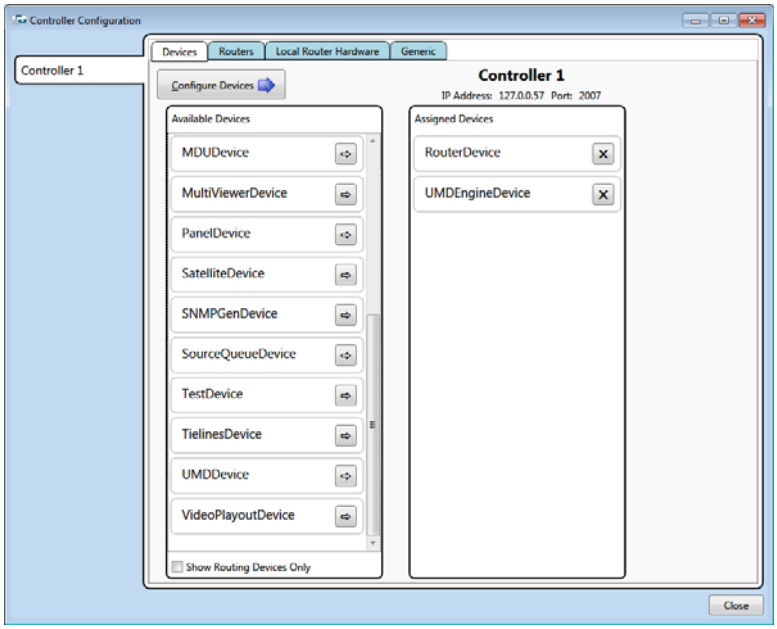

Fig 187. Controller Configuration Screen

3. In the UMD Engine Editor, click the **Add UMD Driver** button, and a new driver is added to the list. Select the Driver from the drop-down list.
4. Click the **Add Tie-line Driver** button, and select the Tie-line from the drop-down list.
5. Click the **Add a new field** button, and a new entry is added to the list. Configure the engine as required.

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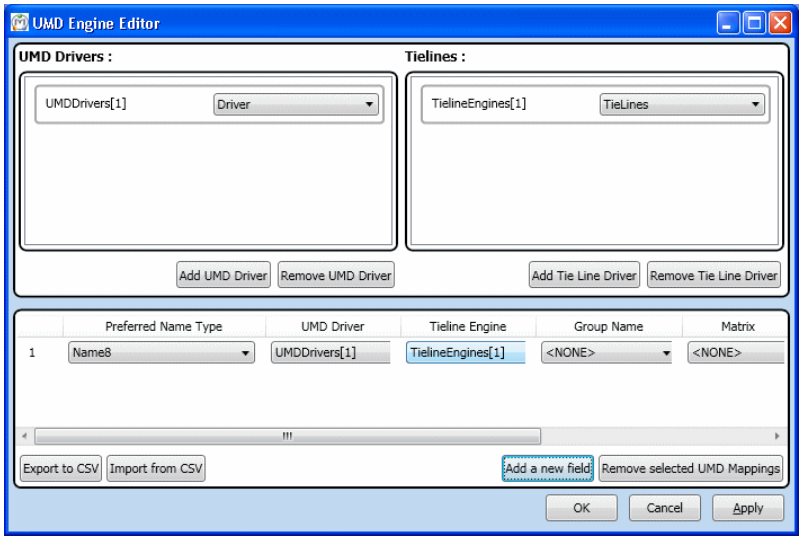

Fig 188. UMD Engine Editor

Controller 2 - Tie-lines and UMD Device

1. Add a second controller, and configure it as a Tie-Line device.
2. In the Tie-line Editor screen, select a **Router Controller**.
3. Click on the **Add new tie line** button, and set the following information:

Column	Description
Name	The name that identifies the Tie-Line.
Auto	Defines whether a tie-line is used automatically, or not.
Group	This allocates tie-lines to a specific group to ensure that routes are available in smaller sub-sections. For example, if n operators must link to their local monitors, there must be n+1 groups to make sure that each operator has a set number of available tie-lines for their use, regardless of how many tie-lines the other operators are using.
Start Matrix	The matrix on the router from which the signal originates.
Start Level	The level from which the signal originates.
Start Dest	The destination from which the signal originates.
End Matrix	The matrix to which the signal is to be sent.
End Level	The level to which the signal is to be sent.
End Source	The source to which the signal is to be sent.

Table 43. Tie-Lines Configuration

4. Click **Apply** to save the Tie-Line configuration.

Note: For UMDs the configuration can be left empty. Select a router device and click the **Synchronise Tie-line tally table** button.

5. From the Devices tab in the Controller Configuration screen, add the UMDDevice to the controller configuration.
6. In the UMD Device Editor screen, click the **Add Group** button. A new group is added to the list, see Fig 189.

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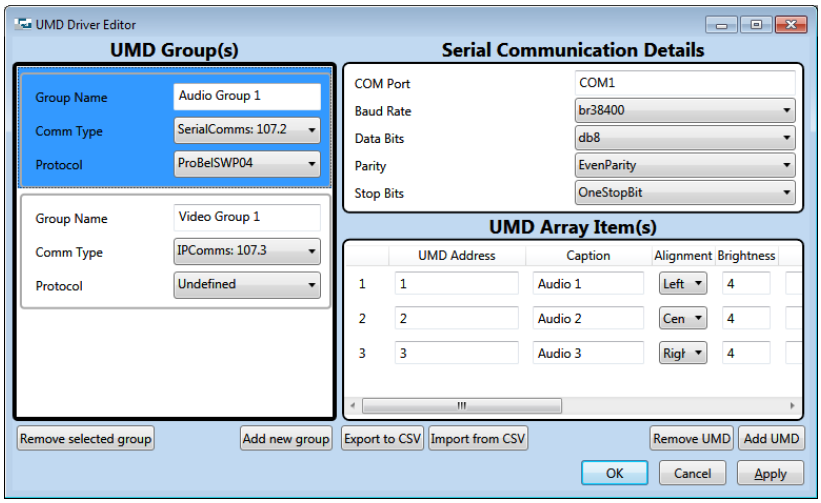

Fig 189. UMD Driver Editor

7. Type a **Group Name**.
8. Select the **Comms Type** from the drop-down list. The options change depending on the selection (there is no automatic check for valid COM ports).
9. Select the **Protocol** from the drop-down list.
10. For each UMD in the group, click **Add UMD**. An entry is added to the list.
11. Enter the UMD Address. Each UMD must have a unique address.

    See the UMD manufacturer's documentation for details.
12. Type the Caption Text to display, its **Alignment**, and **Brightness** (0 = Minimum 8 = Maximum).
13. If required, select up to four tallies.

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Appendix B. Controllers Reference

B.1 2330 Controller

A 2330 Controller can either run on a 2330 Controller Card, or it can run on a PC.

One of the advantages of running a 2330 controller on the PC is that soft screens can be designed without the danger of causing inadvertent disruption to a hardware controller. When a design is completed, push the database to the hardware controller. Although this is a software controller, it can see real devices that are connected to the computer's COM ports.

B.1.1 PC Controller

To create a new 2330 Controller on a PC:

1. From Windows, browse to the Workbench installation folder... \MCM\Controllers\Win32, and copy **CentraController.exe**.
2. Create a new folder on the hard drive (where Administration rights are granted) and paste the CentraController.exe into the folder.
3. Create a shortcut to CentraController.exe.
4. Right-click on the shortcut and select **Properties**.
5. At the end of the Target (after **...Controller.exe"**), type **-port 2007**. Where 2007 is the port number of the controller.
6. Click **OK**.
7. Double-click the shortcut to run the dummy controller. A command window displays.

Note: If multiple controllers are required, repeat steps 1. to 7. and give each controller a different port number and folder (each instance has its own .dccp-config file).

8. From Workbench, open Configuration mode.
9. Click the **Add Controller...** button. The Controller Settings dialog box displays.
10. Select the **Type** from the drop-down list. For 2330 controllers, select **Controller**.
11. Type a **Name** for the controller.
12. Set the **Port** to 2007 (or the port number set in step 5.).
13. Click **OK**. The new 2330 controller is added to the list of controllers.

Configure the 2330 controller in the same way as any other controller, see section 5.4.2.

B.1.2 2330 Controller LEDs

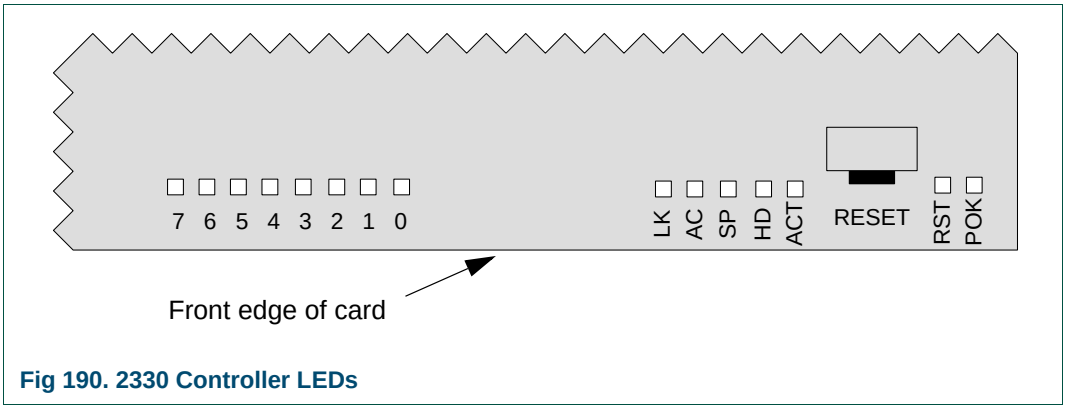

Fig 190. 2330 Controller LEDs

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Table 44. Lists the Nucleus Controller LEDs.

LED	Description
0	ON - Controller Active OFF - Controller Standby
1	ON - Watchdog enabled OFF - Watchdog disabled
2	Flashing - indicates controller running
3	Not used
4	Not used
5	Not used
6	Not used
7	Not used
POK	Power OK
RST	Card is being reset. Reboot follows
ACT	Indicates the active card of a redundant pair
HD	Hard disk activity (if fitted)
SP	Not used
AC	Ethernet Activity. Flickers on send/receive
LK	Ethernet Link Status. Lights when active

Table 44. 2330 Controller LEDs

B.1.3 Updating 2330 Controller Cards

Note: The 2330 Controller can be run as software on a PC.

All 2330 cards store their configuration information on a standard CompactFlash card. The Pbak Deployment tool, which is installed along with Workbench, is used to write the required configuration information to the boot sector of the CompactFlash card.

1. Open Pbak Deploy Tool. From the Windows Start menu:

   Start | All Programs | Snell | MCM | Utilities | Pbak Deploy Tool

2. From the **File** menu, select **Configuration**. The Settings dialog box displays.
3. Select the folder and drive locations.

Target Drive	From the drop-down list, select the drive to which the CompactFlash card is attached.
RTB directory	Specify the directory that contains the RTB executable file. To ensure correct operation, use the most current router RTB file available.
DAT directory	The DAT directory contains configuration files required by the Morpheus Automation system. This is not relevant for Workbench.
On time tools directory	Specify the directory that contains the PbakDeploy.exe file.
Show Makedisk progress	Select this option to display progress information when writing to the CompactFlash card.

Table 45. Pbak Deploy Settings

4. Click **OK**.
5. In the main window, select the Pbl2330Controller.RTB, and click **Write to CF**.
6. When the configuration has been written to the CompactFlash card, click **OK**.

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7. Update the config.xml file to reflect the controller's actual IP address.

   By default, the file is located in the Workbench installation folder... \MCM\PbakDeploy.

8. Save the file and copy it to the CompactFlash card.

B.1.4 2330 Configuration File

The following code shows a sample config.xml file. Update the config.xml file to reflect the controller's IP address and SNMP details.

```
<Config>
    <IP>
        <Adapter>
            <Number>0</Number>
            <DHCP>false</DHCP>
            <Address>10.1.0.10</Address>
            <Port>2007</Port>
            <SubNetMask>255.255.254.0</SubNetMask>
            <DefaultGateway>0.0.0.0</DefaultGateway>
        </Adapter>
    </IP>
    <RollCall>
        <Enabled>false</Enabled>
        <StartupDelay>5</StartupDelay>
        <SharePort>2050</SharePort>
        <BridgePort>2600</BridgePort>
        <BridgeRemoteAddress>128.1.1.1</BridgeRemoteAddress>
        <BridgeAutoConnect>false</BridgeAutoConnect>
        <Name>Router</Name>
        <Information1>Info1</Information1>
        <Information2>Info2</Information2>
        <NetNibbles>1000</NetNibbles>
        <UseLongNames>false</UseLongNames>
    </RollCall>
    <SNMP>
        <Enabled>false</Enabled>
        <Contact>Snell Employee</Contact>
        <Location>Test Lab</Location>
        <SysName>Test System</SysName>
        <EnableSnellTraps>true</EnableSnellTraps>
        <DisableInitialNotify>true</DisableInitialNotify>
        <TrapManagers>
            <Address>172.31.7.133</Address> (up to 10 addresses)
            <Address>172.31.7.134</Address> (for trap managers)
            <Address>172.31.7.135</Address> (may be configured)
        </TrapManagers>
        <CommunityGetNames>
            <Name>getonly</Name>
        </CommunityGetNames>
        <CommunitySetNames>
            <Name>setonly</Name>
        </CommunitySetNames>
    </SNMP>
    <Clock>
        <!-- PAL configuration -->
        <Format>NonDropFrame</Format>
        <FrameRate>Pal</FrameRate>
```

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```
            <VitcLine1>19</VitcLine1>
            <VitcLine2>21</VitcLine2>
            <GenerateVitc>false</GenerateVitc>
            <BurnInColumn>100</BurnInColumn>
            <BurnInLine>50</BurnInLine>
            <SyncLine>7</SyncLine>
        </Clock>
    </Config>
```

B.1.5 RollCall Operation

In order for RollCall to operate the relevant templates must be copied on the controller's compact flash card. The templates are included with the Workbench installer, and deployed (by default) to the Workbench installation folder... \MCM\Controllers\RollCall Templates\2330.

In this folder, the folders "Matrix,", "Nucleus", and "XYPanel" are required. Optionally, the folder "WebContent" can be copied to allow web browser access to the controller.

RollCall also needs to be enabled in the config.xml file. See "2330 Configuration File" on page 189.

Note: The RollCall templates must be updated if the controller software is updated. Both are included in the Workbench installer.

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B.2 Nucleus 2450 Controller

A Nucleus 2450 controller maps the physical inputs and outputs of the router to the software inputs (sources) and outputs (destinations).

To access the Configuration screen, log in as a user with Configuration permissions, see section 4.3.

A Nucleus 2450 controller must be set as a Nucleus Controller (2450), which is a Router controller, with the ability to connect to Panel devices. See “Configuring Controllers” on page 48.

B.2.1 Features

Table 46. lists the main features of the Nucleus 2450 Controller:

Feature	Explanation
Mapping	Logical to physical source and destination mapping. Source and destinations addressed by external controllers can be mapped to different physical sources and destinations on the frame.
Source / Destination numbering and expansion	Non-contiguous source and destination numbering on one level. The mapping capabilities of Workbench makes expansion possible without moving existing modules.
Number of controllable levels	Unlimited.
Expansion / Slaving	Commands received via SW-P-02 can control all levels on a multi level system if levels are slaved using the RJ45 expansion link (for example, Pyxis to Pyxis). Commands received via SW-P-02 cannot control any router slaved using any serial protocol (for example, SW-P-02 / SW-P-08) out (for example, a Freeway slaved from a Pyxis). This applies to routing and audio modifiers. Commands received via SW-P-08 and GVG-ES in can control all frames and levels of a multi level system. This applies whether they are slaved using the RJ45 expansion (Pyxis to Pyxis) or SW-P-02 out on RS422 (for example, Pyxis to Freeway). This includes audio modify commands. Cygnus does not have an RJ45 expansion output, so slaving from Cygnus is not possible.
Level sizes	There is currently a limit for the physical port mapping of a total of 1152 input ports and 1432 output ports with the router expansion bus: The first level is mapped as 576x576 (even on a 17x17 Pyxis), each subsequent level occupies an additional 544 input ports and 544 output ports. This results in a current maximum of 3 levels, depending on level size. Expansion with serial ports does not have this limitation. Router levels can be configured to any size when slaved via SW-P-02 or SW-P-08 out.
Audio capability	Embedded audio is routed along with video. No separate audio routing is available.

Table 46. Nucleus 2450 Controller Features

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B.2.2 Nucleus 2450 Firmware

The Nucleus 2450 firmware runs on an FPGA within the controller. This is loaded every time the controller is booted and consists of the file **PA864.rtf** on the CompactFlash.

There are two methods to update the firmware:

- FTP access to the controller
- Removing the CompactFlash card and plugging it directly into a PC

Update Through FTP

Open a FTP connection to the controller:

1. Open a terminal connection to the Controller (the TCP port is 50000).
2. At the command prompt, type: **login**.

   User:2450

   Password:xyz
3. Type the command: **Programdiskimage pbl2450controller.**
4. Wait for the message **The new boot image was installed successfully**.
5. To reboot the controller, type **Reboot**. Alternatively, click the **Force Reset of Controller** button.

Update Through Pbak

To update the software through the Pbak utility:

1. Open Pbak Deploy Tool. From the Windows Start menu browse to:

   Start | All Programs | Snell | MCM | Utilities | Pbak Deploy Tool
2. Make a backup copy of the existing **PA864.rtf** file, either on the PC or in a folder on the CompactFlash card. If anything goes wrong as a result of this update, restore the original FPGA firmware by putting the backup copy into the root folder of the CompactFlash.
3. Copy the new file “PA864.rtf” onto the CompactFlash card.
4. Force Reset of Controller.

Note: The archive (.zip) file has a firmware revision letter after the PA864 title, but the .rtf file used does not have a revision letter. This is because the Nucleus software always looks for the file with the fixed name **PA864.rtf** on the CompactFlash card. The version letter can be found under “Version” branch in the Generic Editor. See “Generic Editor” on page 94.

B.2.3 Nucleus 2450 LEDs

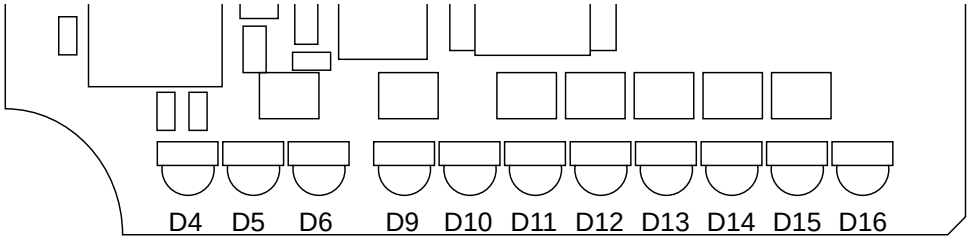

Fig 191. Nucleus 2450 Controller LEDs

Table 47. Lists the Nucleus Controller LEDs.

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LED	Description
D4	Active / Standby • Blue = Active • Purple (Blue + Red) = Standby
D5	100 Mb Ethernet • Green = 100 Mb (Ethernet) • Off = 10 Mb Ethernet/No activity
D6	Ethernet Link • Flashes = Ethernet activity
D9	Crosspoint Switch • Flashes Blue = Crosspoint switched
D10	Not used
D11	Not used
D12	Not used
D13	Communications to other processor • Green = Communications to other processor • Off = No communications to other processor
D14	LTC • Flashes Blue = 625 TC present • Green = 525 TC present • Off = TC not present
D15	An FPGA interface validation error occurs if the software detects a difference between the modules configured in the database and the configuration last written to the modules in the frame. This can happen when a reconfigure is done to recognise new cards and the Nucleus Controller is rebooted. When the Nucleus Controller powers up, if it detects a difference between what was configured last and the current configuration, it applies the new configuration and the D15 LED shows an FPGA validation error, see Fig 191. The next time the Nucleus Controller is rebooted there is no mismatch and therefore the D15 LED is off. If the D15 LED remains on, it could indicate a fault in the interface to the modules. On a dual processor system, the D15 LED can indicate a mismatch between the databases on the two controllers. • Red = FPGA interface validation error • Off = no error
D16	Active / Standby • Flashes Green = Active • Red = Standby

Table 47. Nucleus 2450 Controller LEDs

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B.2.4 Network Initialization File

Each controller has its own configuration file that defines the network connections. The Network.ini file can be edited using a text editor, for setting the IP address, for example.

The following fields are required in the Network.ini file:

[NETWORK]	
Force10M=1	The “Force10M” flag specifies whether the network speed of the controller is limited to 10Mbits per second or 100Mbits per second. If this value is set to 1 then the network speed is limited to 10Mbits per second. If it is set to 0 the network connection can operate up to 100Mbits per second. If this value is omitted from the .ini file the connection defaults to 10Mbits per second. For Cygnus routers this must be set to 1. For maximum compatibility and reliability, set this value to 1.
IPAddress= nnn.nnn.nnn.nnn	This specifies a standard 4 byte IPv4 address. This value is not used if “UseDHCP” is set to 1.
SubNetMask= nnn.nnn.nnn.nnn.	This specifies a standard 4 byte IPv4 subnet mask. This value is not used if “UseDHCP” is set to 1.
DefaultGateway= nnn.nnn.nnn.nnn	This specifies a standard 4 byte IPv4 address of the default gateway. This value is not used if “UseDHCP” is set to 1.
DNSAddress= nnn.nnn.nnn.nnn	This specifies a standard 4 byte IPv4 address of the domain name server. This value is not used if “UseDHCP” is set to 1.
UseDHCP=1	The “UseDHCP” parameter is used to specify if the Nucleus controller should obtain an IP address via DHCP (as opposed to the address specified in the ini file). If this is set to 1 then the IP address of the controller is assigned by the local DHCP server and the IPAddress, SubNetMask, DefaultGateway and DNSAddress settings in the ini file are ignored. If it is set to 0 then the ini file settings is used. If “UseDHCP” is not specified in the ini file then it defaults to 1.
UseSNMP=1	The “UseSNMP” flag enables or disables the SNMP features on the controller card. If set to 0 no SNMP features are activated on the card. If set to 1 the SNMP features are activated (subject to the restrictions in the next section). **Note**. If this changes, the card requires a restart. If this entry is omitted from the ini file it defaults to 0.

[SNMP]	
Version=Version Description Text	The “Version” variable is the text that is returned when the sysDescr SNMP request (.1.3.6.1.2.1.1.1) is received by the card.
Contact=Unknown	The “Contact” variable is the text that is returned when the sysContact SNMP request (.1.3.6.1.2.1.1.4) is received by the card. This can be set to the name and/or contact details responsible for this equipment.
Location=Unknown	The “Location” variable is the text that is returned when the sysLocation SNMP request (.1.3.6.1.2.1.1.6) is received by the card. This can be set to the physical location of the equipment in the facility.
SysName=2450	The “SysName” variable is the text that is returned when the SysName SNMP request (.1.3.6.1.2.1.1.5) is received by the card. This can be set to the name by which the equipment is locally referred to.

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[SNMP]	
NumberCommunityGetNames=1	The “NumberCommunityGetNames” variable is used to specify how many community get names are listed in the ini file using the CommunityGetNameN variable. Up to 2 community strings of up to 20 characters in length can be specified for get operations. This is typically set to 1.
NumberCommunitySetNames=1	The “NumberCommunitySetNames” variable is used to specify how many community get names are listed in the ini file using the CommunitySetNameN variable. Up to 2 community strings of up to 20 characters in length can be specified for set operations. This is typically set to 1.
TrapManager=1	The “TrapManager” variable is used to specify how many trap manager addresses are listed in the ini file using the TrapManagerAddrN variable. Up to 10 trap manager addresses can be specified. Any more than this is ignored. This is typically set to 1.
TrapManagerAddrN=172.31.7.133	The “TrapManagerAddrN” variable is used to specify the IP address for trap managers. The N should be replaced by the number of the trap manager (1-10).
CommunityGetNameN=public	The “CommunityGetNameN” variable is used to specify 1 of the community strings used for get operations. The N should be replaced by a unique digit (either 1 or 2).
CommunitySetNameN=private	The “CommunitySetNameN” variable is used to specify 1 of the community strings used for set operations. The N should be replaced by a unique digit (either 1 or 2).
EnableSnellTraps=1	The “EnableSnellTraps” variable is used to specify whether traps are sent for changes to certain Snell specific variables. If this is set to 0 MIBv2 system traps are sent, but no Snell specific traps (for example, routed source change) are sent.
TrapMessageDelay=10	The “TrapMessageDelay” variable specifies the number of milliseconds minimum that occurs between consecutive Snell trap messages. For example if it is set to 10 there is a gap of at least 10ms between each Snell specific trap message that is sent. The reason for this is that when large numbers of crosspoints are changed simultaneously (for example) a large number of traps can be sent in quick succession, which can cause unnecessary loading on the controller and management station. It is recommended that this variable is set to a value between 0 and 100. Note: No traps are discarded as a result of this setting they are simply queued up and sent at the specified intervals.
DisableInitialNotify=1	The “DisableInitialNotify” flag can be used to prevent the controller card from sending power on startup traps for each variable type that supports traps. The reason for implementing this flag is that in a router with a large number of destinations (512 for example) there are 5 trappable parameters per destination. On startup this particular router would result in 2560 traps for the destination variables alone. By setting this variable to 1 these initial traps are not sent (but all subsequent ones are). This is global setting that affects all Snell specific variables.

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B.2.4.1 Example INI File

The following is an example of the Network.ini file:

```
[NETWORK]
Force10M=1
IPAddress=172.31.9.111
SubNetMask=255.255.224.0
DefaultGateway=172.31.1.6
DNSAddress=0.0.0.0
UseDHCP=0
UseSNMP=0

[DEBUG]
RTIPDiag=0

[ROLLCALL]
Enable=0
StartupDelay=5
SharePort=2050
BridgePort=2600
BridgeRemoteAddress=128.1.1.1
BridgeAutoConnect=0
Name=2450
Information1=Info1
Information2=Info2
NetNibbles=1000
UseLongNames=0

[SNMP]
Contact=Unknown
Location=Unknown
SysName=2450
NumberCommunityGetNames=1
NumberCommunitySetNames=1
TrapManager=1
TrapManagerAddr1=172.31.7.133
CommunityGetName1=getonly
CommunitySetName1=setonly
EnableSnellTraps=1
TrapMessageDelay=100
DisableInitialNotify=1
DisableOutputSignalTraps=1
DisableInputSignalTraps=1
DisableCrossPointTraps=1
DisableProtectStateTraps=1
DisableSrcAudioModifyTraps=1
DisableDestAudioModifyTraps=1
DisableFanFaultTraps=0
DisablePSUFaultTraps=0
DisableOutputStandardTraps=1
DisableInputStandardTraps=1
DisableModuleTypeTraps=1
DisableModulePresentTraps=1
DisableControllerCommsTraps=1
DisableMonitorRowPortTraps=1
DisableMonitorRowInputNotOutputTraps=1
```

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B.2.5 Configuration Initialization File

The following entries are required in the Config.ini file:

[DEBUG]	
TestMode=0	Internal testing only. Set to “=0”

[ROUTING]	
Set_Delay=-1	A delay in milliseconds before setting a crosspoint following the first crosspoint received. The default is -1 (disabled). The purpose is to ensure multiple crosspoints, sent serially, are set on a single frame boundary. For example, if an external controller is setting two crosspoints serially using general switcher protocol, and the external controller cannot tell where in the frame it is sending the messages, it is possible for one crosspoint to go on one frame, and the second on the next, if the serial commands straddled a frame. By configuring a Set Delay of two milliseconds (the time to send the second crosspoint), both crosspoints will have been received when they are set. That way both crosspoints will go on the same frame.

[CONFIG]	
ResetAfterConfigPush=1	Configure the action to be taken after a configuration push. Set to “1” to restart the controller after a full database push. Default “0” disables automatic restart.

[O2overIP]	
Enable=true	Enables SW-P-02 protocol over IP control. **Note:** The default setting for this parameter is Enabled, so if the parameter is missing, or commented out, it will still be enabled.
TCP_IP_Port=2000	Port used for TCP/IP server connection. Default port is 2000.
UDP_Connect_Port=2001	Port used for UDP broadcast messages for connecteds. Default port is 2001.
UDP_Stat6_Port=2002	Port used for UDP broadcast messages for status 6 changes. Default port is 2002.
Connect_MC_addr=224.1.1.1	Multi-cast address used for connecteds. Default address is 224.1.1.1
Stat6_MC_addr=224.1.1.2	Multi-cast address used for status 6 changes. Default address is 224.1.1.2
TCP_IP_Link_Time=0	Time (in milliseconds on SC12/SC13, seconds on 2450) that the link remains open after the last message is received. A value of 0 causes the link to remain open indefinitely. Default is 60000 / 60 (1 minute).

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Polltime=1000	The frequency (in milliseconds) SC12 polls the router for status. Default value is every 1000 milliseconds. Increasing this value reduces the load on SC12 and the router by polling it less frequently. However, it does in crease the time before an error is reported. It may be necessary to do this on a heavily loaded SC12 or router. Reducing this value reduces the time before an error is reported but increases the load on the SC12 and the router. The value should not be set lower than the TIMEOUT value.
Timeout=50	This is the timeout in milliseconds for a response from the router. The default is 50 milliseconds. This should be sufficient for most routers when single commands are sent in a TCP/IP packet. If multiple connect messages are sent in a single TCP/IP packet the timeout should be increased to 200 milliseconds. Also if the router is heavily loaded this value may need to be increased. The number of TCP/IP connections to the SC12 should not effect the timeout, since this is the timeout on the serial port to the router. The clients connecting to the SC12 may need to adjust their timeout for the response on the network due to messages on multiple TCP/IP connections being serialized to the router.
Return_Status_5=true	This determines whether status request 1 messages return the status response 5 message, or whatever response is returned from the router. The default is YES. Setting this to NO means that status response 1 to 4 are returned depending on what router the SC12 is connected to (See SW-P-02 for which routers return which responses). This is intended for use with existing equipment that does not support the status response 5 message.
TCP_Connecteds=true	Used to switch on or off unsolicited connects on the TCP connection. When set to false a connected messages are only sent on a TCP port in response to a connect on that TCP port. When set to true it behaves more like the serial ports in that whenever a crosspoint is set a connected is sent on all open TCP connections, even if not set by a command on that port, for example, a panel. The default =true.
Connect_MC_ENA=true	Enables the multi-cast address used for connecteds. Default=true.
Stat6_MC_ENA=true	Enables the multi-cast address used for status 5 changes. Default=true.

[PyxisVideoInputMonitoring]	
Output=17	This entry specifies which output on the router is used for checking the signal lock on the inputs. Each input is routed to this output in turn and if the output obtains a signal lock then the input is deemed to have a valid input signal. This feature enables input signal presence monitoring without dedicated hardware. This value must be a valid (and unused) output port on the router. To disable the Video Input monitoring feature completely set this value to 0.
FirstInput=1	This entry specifies the first input port on the router that input signal monitoring is enabled for. This is the first input that is routed to the output port listed above for monitoring purposes. This value must be a valid input port on the router.

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[PyxisVideoInputMonitoring]	
LastInput=17	This entry specifies the last input port on the router that input signal monitoring is enabled for. This is the last input that is routed to the output port listed above for monitoring purposes. This value must be a valid input port on the router. The video input monitoring algorithm continually cycles through all inputs between in FirstInput and LastInput values (inclusive).
ReadTime=400	This entry specifies the time (in milliseconds) that each input is sampled for before switching to the next input. This time must be sufficient to enable the crosspoint to switch and the signal to lock. The recommended minimum time for this is 400. The time it takes the SNMP interface to recognise a loss of input signal is no greater than this value multiplied by the number of sources being monitored. For example, for 17 sources and a ReadTime of 400 it would take SNMP no longer than (17 x 400) 6800ms (6.8s).
SignalPresentFromLocked=true	This entry specifies whether the SNMP input signal presence value should be set when the signal is locked. It is recommended this is always set to true. If it is set to false, only the input standard locked value is set.

B.2.6 RollCall Operation

In order for RollCall to operate the relevant templates must be copied on the controller's compact flash card. The templates are included with the Workbench installer, and deployed (by default) to the Workbench installation folder... \MCM\Controllers\RollCall Templates\2450.

In this folder, the folders "Matrix,", "Nucleus", and "XYPanel" are required. Optionally, the folder "WebContent" can be copied to allow web browser access to the controller.

RollCall also needs to be enabled in the network.ini file. See "Example INI File" on page 196.

Note: The RollCall templates must be updated if the controller software is updated. Both are included in the Workbench installer.

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B.3 246x Controllers

A 246x (2462, 2463, etc) controller maps the physical inputs and outputs of the router to the software inputs (sources) and outputs (destinations).

To access the Configuration screen, log in as a user with Configuration permissions, see section 4.3.

A 246x controller must be set as a Router controller with RouterDevice and LocalRouterDevice selected.

B.3.1 Features

Table 48. lists the main features of the 246x Controller:

Feature	Explanation
Mapping	Logical to physical source and destination mapping. Source and destinations addressed by external controllers can be mapped to different physical sources and destinations on the frame.
Source / Destination numbering and expansion	Non-contiguous source and destination numbering on one level. The mapping capabilities of Workbench makes expansion possible without moving existing modules.
Number of controllable levels	Unlimited.
Level sizes	There is a limit for the physical port mapping input ports and output ports with the router expansion bus. See the appropriate router manual for the number of input and output ports available. Expansion with serial ports does not have this limitation. Router levels can be configured to any size within the limits of the protocol when slaved via SW-P-02 or SW-P-08 out.
Audio capability	Up to 32 channels of Mono, Stereo or Dolby ‘grouped’ routing and processing on a per channel basis. See compatible routers for details of audio capabilities.

Table 48. 246x Controller Features

B.3.2 246x Firmware Update

1. Locate the Standby 246x controller, see Fig 192. for LED positions:

   LED 1:
   Standby = Flashing Blue
   Active = Flashing Green

2. Check that the LED confirms the controller is in Standby.

3. Insert the USB memory stick in the USB connector on the front of Standby controller (see Fig 192.).

   For details of the contents of the USB memory stick, see the relevant router manual.

4. Press the **Reset** button (see Fig 192.).

5. The controller will reboot and the new software will be copied to the controller.

6. When all of the LEDs on the controller flash green the process is complete and the controller can be rebooted.

7. Remove the USB memory stick and press the **Reset** button to reboot the controller.

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B.3.2.1 Updating the Software in the Second Controller

1. If the second controller remains **Active** press its **Reset** button (see Fig 192.). The Active and Standby controllers swap over.
2. Repeat the procedure from step 2. on page 200 to step 7. on page 200 for the second controller.

Important: Remove the USB memory stick before shutting the door on a router. Leaving the USB memory stick in the controller will result in damage to the USB memory stick and the controller.

B.3.3 246x Controller LEDs

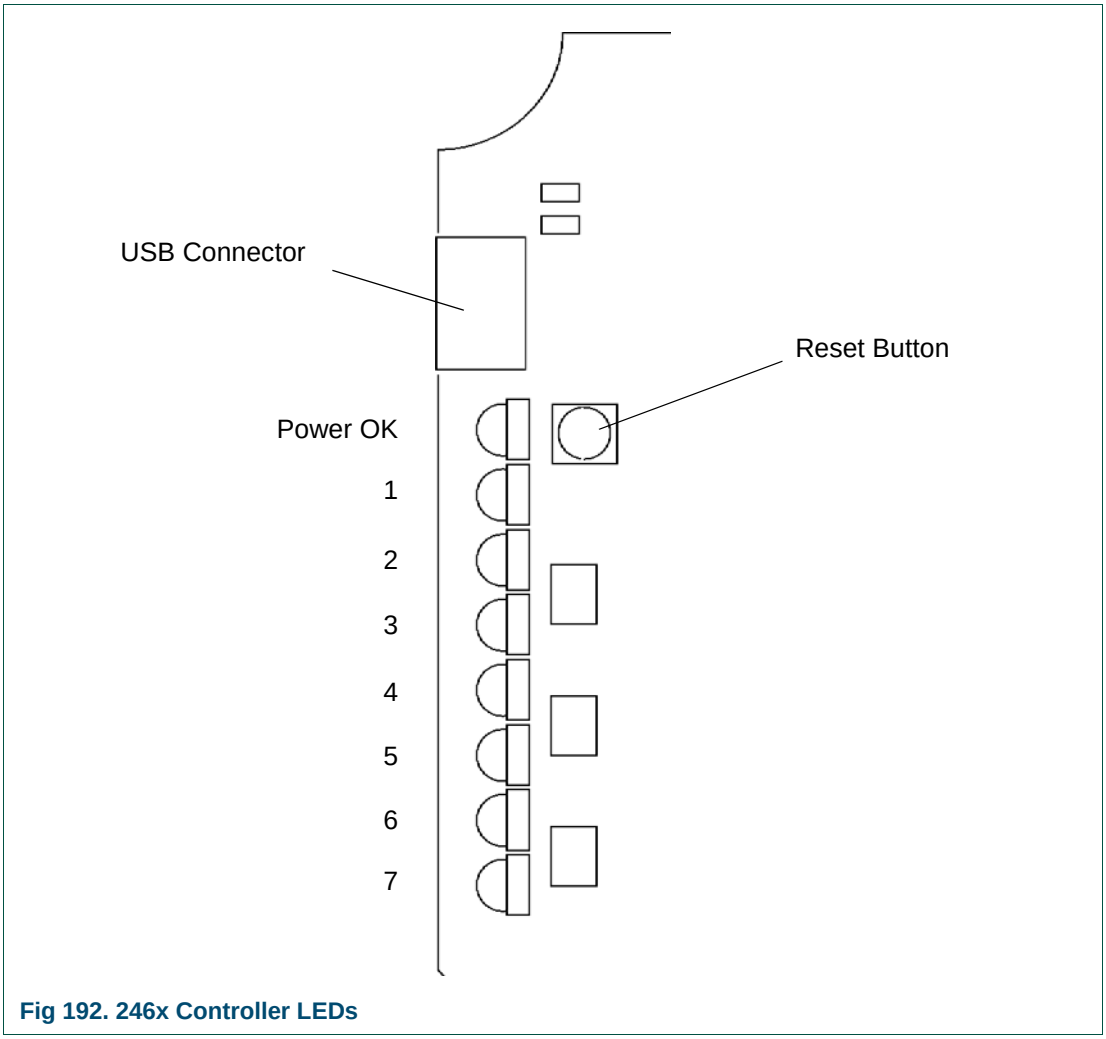

Fig 192. 246x Controller LEDs

Table 47. Lists the Nucleus Controller LEDs.

LED	Description
Power OK	Power OK • Green = Power is connected and OK • Off = Power is not connected or not OK
1	Active / Standby • Flashes Green = Active • Flashing Blue = Standby

Table 49. 246x Controller LEDs

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LED	Description
2	Master / Slave • Green = Master Controller • Blue = Slave Controller
3	Watchdog Status • Flashing Green = Watchdog enabled and running • Flashing Orange = Watchdog disabled
4	Serial Link Between Controllers Displays the status of the serial link between the active and idle controllers. See LED 5 for further information. • Blue pulsing Green = Link okay, data is being transferred. • Green pulsing Blue = Link okay, no data is being transferred. • Magenta pulsing Blue = Link error, no connection with the other controller. Indicates; the other controller is not present/not running or the serial link is not working. • Orange Pulses = Error, received data for unconfigured device Indicates; the other controller is configured differently from the controller receiving the data or it has no configuration. • Red Pulses = Error, received data with invalid format.
5	Serial Data Replication (Local Router Device) The Serial Link is used to replicate LocalRouter device data between the active and idle controllers. Replicated data includes; crosspoint status, module configuration and port configuration. • Off = Active Controller • Flashing Green = Idle controller, receiving background update data. • Flashing Orange = Idle controller, data synchronisation with Active controller in progress.
6	Not used
7	Not used

Table 49. 246x Controller LEDs

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B.3.4 246x Configuration File

The following code shows a sample config.xml file. Update the config.xml file to reflect the controller's IP address and other networking and SNMP details.

```
<Config>
    <IP>
        <Adapter>
            <Number>0</Number>
            <DHCP>false</DHCP>
            <Address>10.1.0.10</Address>
            <Port>2007</Port>
            <SubNetMask>255.255.254.0</SubNetMask>
            <DefaultGateway>0.0.0.0</DefaultGateway>
        </Adapter>
    </IP>
    <RollCall>
        <Enabled>false</Enabled>
        <StartupDelay>5</StartupDelay>
        <SharePort>2050</SharePort>
        <BridgePort>2600</BridgePort>
        <BridgeRemoteAddress>128.1.1.1</BridgeRemoteAddress>
        <BridgeAutoConnect>false</BridgeAutoConnect>
        <Name>Router</Name>
        <Information1>Info1</Information1>
        <Information2>Info2</Information2>
        <NetNibbles>1000</NetNibbles>
        <UseLongNames>false</UseLongNames>
    </RollCall>
    <SNMP>
        <Enabled>true</Enabled>
        <Contact>Snell Employee</Contact>
        <Location>Test Lab</Location>
        <SysName>Test System</SysName>
        <EnableSnellTraps>true</EnableSnellTraps>
        <DisableInitialNotify>true</DisableInitialNotify>
        <TrapManagers>
            <Address>172.31.7.133</Address> (up to 10 addresses)
            <Address>172.31.7.134</Address> (for trap managers)
            <Address>172.31.7.135</Address> (may be configured)
        </TrapManagers>
        <CommunityGetNames>
            <Name>getonly</Name>
        </CommunityGetNames>
        <CommunitySetNames>
            <Name>setonly</Name>
        </CommunitySetNames>
    </SNMP>
    <Clock>
        <!-- PAL configuration -->
        <Format>NonDropFrame</Format>
        <FrameRate>Pal</FrameRate>
        <VitcLine1>19</VitcLine1>
        <VitcLine2>21</VitcLine2>
        <GenerateVitc>false</GenerateVitc>
        <BurnInColumn>100</BurnInColumn>
        <BurnInLine>50</BurnInLine>
```

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```
            <SyncLine>7</SyncLine>
        </Clock>
        <Replication>
            <Name />
            <Address />
            <Port>0</Port>
        </Replication>
        <FeatureFlags>
            <AutoChangeOverIfNoNetworkTime>
                 -1</AutoChangeOverIfNoNetworkTime>
            <ResetAfterConfigurationPush>
                 true</ResetAfterConfigurationPush>
        </FeatureFlags>
        <Watchdog>
            <Enabled>true</Enabled>
        </Watchdog>
    </Config>
```

B.3.5 RollCall Operation

In order for RollCall to operate the relevant templates must be copied on the controller. The templates are included with the Workbench installer, and deployed (by default) to the Workbench installation folder... \MCM\Controllers\RollCall Templates\S800.

Copy all sub-folders to the controller.

RollCall also needs to be enabled. This is set in the Generic Online Editor, under the ConfigurationItems node. Expand the RollCall node, and set Enabled to “True”.

Note: The RollCall templates must be updated if the controller software is updated. Both are included in the Workbench installer.

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B.4 RollCall Gateway

To configure a RollCall Gateway:

1. Navigate to the configuration screen and add a RollCall controller.
2. Ensure that connection to the controller has been established by checking the connection state icon.
3. When connection has been established, Workbench automatically initiates discovery of the RollCall network. Note that it may take several minutes to complete discovery of a network the first time round. Information about the network is cached in order to speed up future discovery attempts.
4. Open the online generic editor and expand the **Frames Detected** branch. The branch may be populated with a set of one or more subnets, each of which may be populated with a set of one or more racks.
5. Close the online editor and pull the controller's configuration.
6. Open the offline generic editor. The **Frames Detected** branch should contain a snapshot of the live network.
7. Right-click on the **Frames Detected** node and select **Copy**. Right-click on the **Frames** node and select **Paste**. A copy of the detected branch should appear underneath the **Frames** node.

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Appendix C. Routers Reference

C.1 Pyxis Routers

C.1.1 Install the Sample Pyxis Database

The sample database for Pyxis routers has several example controllers and hardware panels, and are installed as part of the Workbench installation. To install the sample database:

1. Browse to:

   Start | All Programs | Snell | MCM | Utilities | Example Databases

2. The example databases are in .zip folders. Right-click the **DefaultPyxisControllersV3_9.zip** and select **Extract All...** the Extraction Wizard displays.

3. Browse to an appropriate location for the files, and click **Next**. The files are extracted to the selected location. Click **Finish**.

4. Make sure that Workbench is **NOT** open.

5. Open SQL server management express and connect to the server.

6. Right-click on the Workbench database and select **Tasks | Restore | Database**.

7. In the **Source for restore** section, select **From device** and click the (browse) button. The Specify Backup dialog box displays, click **Add**.

8. Locate the **WorkBenchPyxisDefaultControllersMCMV3_9.bak** file, select it and then click **OK**.

9. In the **Specify Backup** dialog box, click **OK**.

10. Select the file from the **Select the backup sets to restore** section of the Restore Database dialog box.

11. In the **Select a page section**, click **Options**. Select Overwrite the existing database and Leave the database ready to use... (RESTORE WITH RECOVERY).

12. Click **OK**.

13. Start Workbench.

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C.1.2 Sample Controllers

Each controller has a standard set of control panels supplied in the sample database.

C.1.2.1 Pyxis AES - 144x144 Ref1

Dual 2450 Nucleus controller configured with independent IP address that controls a single level of routing up to 144x144 AES (actual router size is dependent on cards and rear connectors fitted to Pyxis frame). All MADI Inputs and Outputs have been hidden (mapped out) in the Logical to Physical port mapping tables so that controller is purely the AES inputs and outputs only.

Pyxis Serial port configuration:

Port 1 (Workbench COM 3) = General Switcher In (SW-P-02) for Aurora control

Port 2 (Workbench COM 4) = General Switcher In (SW-P-02) for Aurora control

Port 3 (Workbench COM 5) = Panel Protocol with a 6276 X-Y configured for numerical control of all inputs and outputs on address 1

Reference 1 has been configured as the primary reference source for all inputs

C.1.2.2 Pyxis AA - 144x144 Stereo Ref1

Dual 2450 Nucleus controller configured with independent IP address that controls a single level of routing up to 144x144 Stereo (actual router size is dependent on cards and rear connectors fitted to Pyxis frame). All MADI Inputs and Outputs have been hidden (mapped out) in the Logical to Physical port mapping tables so that controller is purely the Stereo inputs and outputs only

Pyxis Serial port configuration:

Port 1 (Workbench COM 3) = General Switcher In (SW-P-02) for Aurora control

Port 2 (Workbench COM 4) = General Switcher In (SW-P-02) for Aurora control

Port 3 (Workbench COM 5) = Panel Protocol with a 6276 X-Y configured for numerical control of all inputs and outputs on address 1

Reference 1 has been configured as the primary reference source for all inputs

C.1.2.3 Pyxis AA - 272x272 Stereo (64 MADI) Ref1

Dual 2450 Nucleus controller configured with independent IP address that controls a single level of routing up to 272x272 Stereo (actual router size is dependent on cards and rear connectors fitted to Pyxis frame). All MADI Inputs and Outputs are exposed in the Logical to Physical port mapping tables as pairs so that they are controllable, please refer to the Pyxis handbook “Audio Port Numbering” section for more details

Pyxis Serial port configuration:

Port 1 (Workbench COM 3) = General Switcher In (SW-P-02) for Aurora control

Port 2 (Workbench COM 4) = General Switcher In (SW-P-02) for Aurora control

Port 3 (Workbench COM 5) = Panel Protocol with a 6276 X-Y configured for numerical control of all inputs and outputs on address 1

Reference 1 has been configured as the primary reference source for all inputs

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C.1.2.4 Pyxis AA - 288x288 Mono Ref1

Dual 2450 Nucleus controller configured with independent IP address that controls a single level of routing up to 288x288 MONO (actual router size is dependent on cards and rear connectors fitted to Pyxis frame). All MADI Inputs and Outputs have been hidden (mapped out) in the Logical to Physical port mapping tables so that controller is purely the MONO inputs and outputs only

Pyxis Serial port configuration:

Port 1 (Workbench COM 3) = General Switcher In (SW-P-02) for Aurora control

Port 2 (Workbench COM 4) = General Switcher In (SW-P-02) for Aurora control

Port 3 (Workbench COM 5) = Panel Protocol with a 6276 X-Y configured for numerical control of all inputs and outputs on address 1

Reference 1 has been configured as the primary reference source for all inputs

C.1.2.5 Pyxis AA - 544x544 Mono (64 MADI) A Ref1

Dual 2450 Nucleus controller configured with independent IP address that controls a single level of routing up to 544x544 MONO (actual router size is dependent on cards and rear connectors fitted to Pyxis frame). All MADI Inputs and Outputs are exposed in the Logical to Physical port mapping tables on to one so that they are controllable please refer to the Pyxis handbook “Audio Port Numbering” section for more details

Pyxis Serial port configuration:

Port 1 (Workbench COM 3) = General Switcher In (SW-P-02) for Aurora control

Port 2 (Workbench COM 4) = General Switcher In (SW-P-02) for Aurora control

Port 3 (Workbench COM 5) = Panel Protocol with a 6276 X-Y configured for numerical control of all inputs and outputs on address 1

Reference 1 has been configured as the primary reference source for all inputs

C.1.2.6 Pyxis Video - 72x72 Ref1

Dual 2450 Nucleus controller configured with independent IP address that controls a single level of routing up to 72x72 Video (Video signal format and actual router size is dependent on cards and rear connectors fitted to Pyxis frame)

Pyxis Serial port configuration:

Port 1 (Workbench COM 3) = General Switcher In (SW-P-02) for Aurora control

Port 2 (Workbench COM 4) = General Switcher In (SW-P-02) for Aurora control

Port 3 (Workbench COM 5) = Panel Protocol with a 6276 X-Y configured for numerical control of all inputs and outputs on address 1

Reference 1 has been configured as the primary reference source for all inputs

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C.1.2.7 Pyxis Timecode - 128x128 Ref1

Dual 2450 Nucleus controller configured with independent IP address that controls a single level of routing up to 128x128 Time Code

Pyxis Serial port configuration:

Port 1 (Workbench COM 3) = General Switcher In (SW-P-02) for Aurora control

Port 2 (Workbench COM 4) = General Switcher In (SW-P-02) for Aurora control

Port 3 (Workbench COM 5) = Panel Protocol with a 6276 X-Y configured for numerical control of all inputs and outputs on address 1

Reference 1 has been configured as the primary reference source for all inputs

C.1.2.8 Pyxis RS422 - 128x128 A Ref1

Dual 2450 Nucleus controller configured with independent IP address that controls a single level of routing up to 128x128 RS422

Pyxis Serial port configuration:

Port 1 (Workbench COM 3) = General Switcher In (SW-P-02) for Aurora control

Port 2 (Workbench COM 4) = General Switcher In (SW-P-02) for Aurora control

Port 3 (Workbench COM 5) = Panel Protocol with a 6276 X-Y configured for numerical control of all inputs and outputs on address 1

Reference 1 has been configured as the primary reference source for all inputs

C.1.3 Sample Panels

The sample panels match the controllers:

- AAMono 6276-00 - The default controller is: PyxisAnalogueAudio288x288MonoRef1
- AAStereo 6276-00 - The default controller is: PyxisAnalogueAudio144x144StereoRef1
- AES 6276-00 - The default controller is: PyxisAES144x144Ref1
- Video 6276-00 - The default controller is: PyxisVideo72x72Ref1

Note: All the sample screens have an identical layout, see Fig 193.

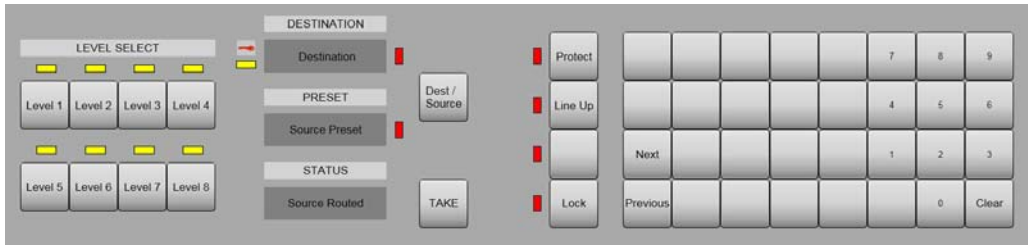

Fig 193. Pyxis Screens

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C.1.4 Pyxis Module Locations

For each router, it is important that the correct module addresses are set in the Workbench controller configuration.

Note: If the auto-configuration option is used, the number and types of module configurations are automatically set. Any modules that are not present or not recognized are identified as **TUnknownModule**.

Fig 194. shows the Pyxis card locations.

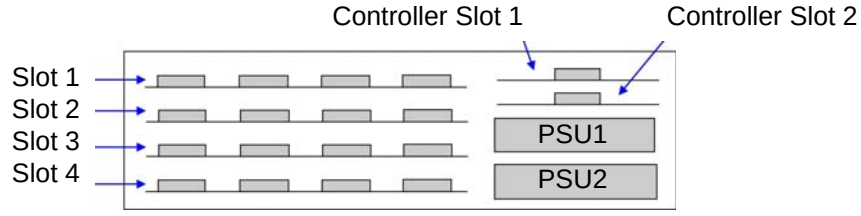

Fig 194. Pyxis Card Locations

		Level Hex SW	Offset	Edit Module Configuration Number		Notes	Input Port Number range	Output Port Number range
Pyxis Frame 1								
XPT 1	Cont A	0	0	10			1 - 544	1 - 544
XPT 2	Cont B	0	1	11				
XPT 3	PSU 1	0	2	12				
XPT 4	PSU 2	0	3	13				
Pyxis Frame 2 (Level 2)								
XPT 1	Cont A	1	0	20	1	Slave 2452 (Only Knows about ACTIVE card) Address switch set to 1	577 - 1120	577 - 1120
XPT 2	Cont B	1	1	21				
XPT 3	PSU 1	1	2	22				
XPT 4	PSU 2	1	3	23				
Pyxis Frame 3 (Level 3)								
XPT 1	Cont A	2	0	30	2	Slave 2452 (Only Knows about ACTIVE card) Address switch set to 2	1121 - 1664	1121 - 1664
XPT 2	Cont B	2	1	31				
XPT 3	PSU 1	2	2	32				
XPT 4	PSU 2	2	3	33				
Pyxis Frame 4 (Level4)								
XPT 1	Cont A	3	0	40	3	Slave 2452 (Only Knows about ACTIVE card) Address switch set to 3	1665 - 2208	1665 - 2208
XPT 2	Cont B	3	1	41				
XPT 3	PSU 1	3	2	42				
XPT 4	PSU 2	3	3	43				
Pyxis Frame 5 (Level 5)								

Table 50. Pyxis Module Address Locations

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		Level Hex SW	Offset	Edit Module Configuration Number		Notes	Input Port Number range	Output Port Number range
XPT 1	Cont A	4	0	50	4	Slave 2452 (Only Knows about ACTIVE card) Address switch set to 4	2209 - 2752	2209 - 2752
XPT 2	Cont B	4	1	51				
XPT 3	PSU 1	4	2	52				
XPT 4	PSU 2	4	3	53				
Pyxis Frame 6 (Level 6)								
XPT 1	Cont A	5	0	60	5	Slave 2452 (Only Knows about ACTIVE card) Address switch set to 5	2753 - 3296	2753 - 3296
XPT 2	Cont B	5	1	61				
XPT 3	PSU 1	5	2	62				
XPT 4	PSU 2	5	3	63				
Pyxis Frame 7 (Level 7)								
XPT 1	Cont A	6	0	70	6	Slave 2452 (Only Knows about ACTIVE card) Address switch set to 6	3297 - 3840	3297 - 3840
XPT 2	Cont B	6	1	71				
XPT 3	PSU 1	6	2	72				
XPT 4	PSU 2	6	3	73				
Pyxis Frame 8 (Level 8)								
XPT 1	Cont A	7	0	80	7	Slave 2452 (Only Knows about ACTIVE card) Address switch set to 7	3841 - 4384	3841 - 4384
XPT 2	Cont B	7	1	81				
XPT 3	PSU 1	7	2	82				
XPT 4	PSU 2	7	3	83				

Table 50. Pyxis Module Address Locations

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C.2 Sirius 800 Routers

C.2.1 Sirius 850 Module Locations

For each router, it is important that the correct module addresses are set in the Workbench controller configuration.

Note: If the auto-configuration option is used, the number and types of module configurations are automatically set. Any modules that are not present or not recognized are identified as **TUnknownModule**.

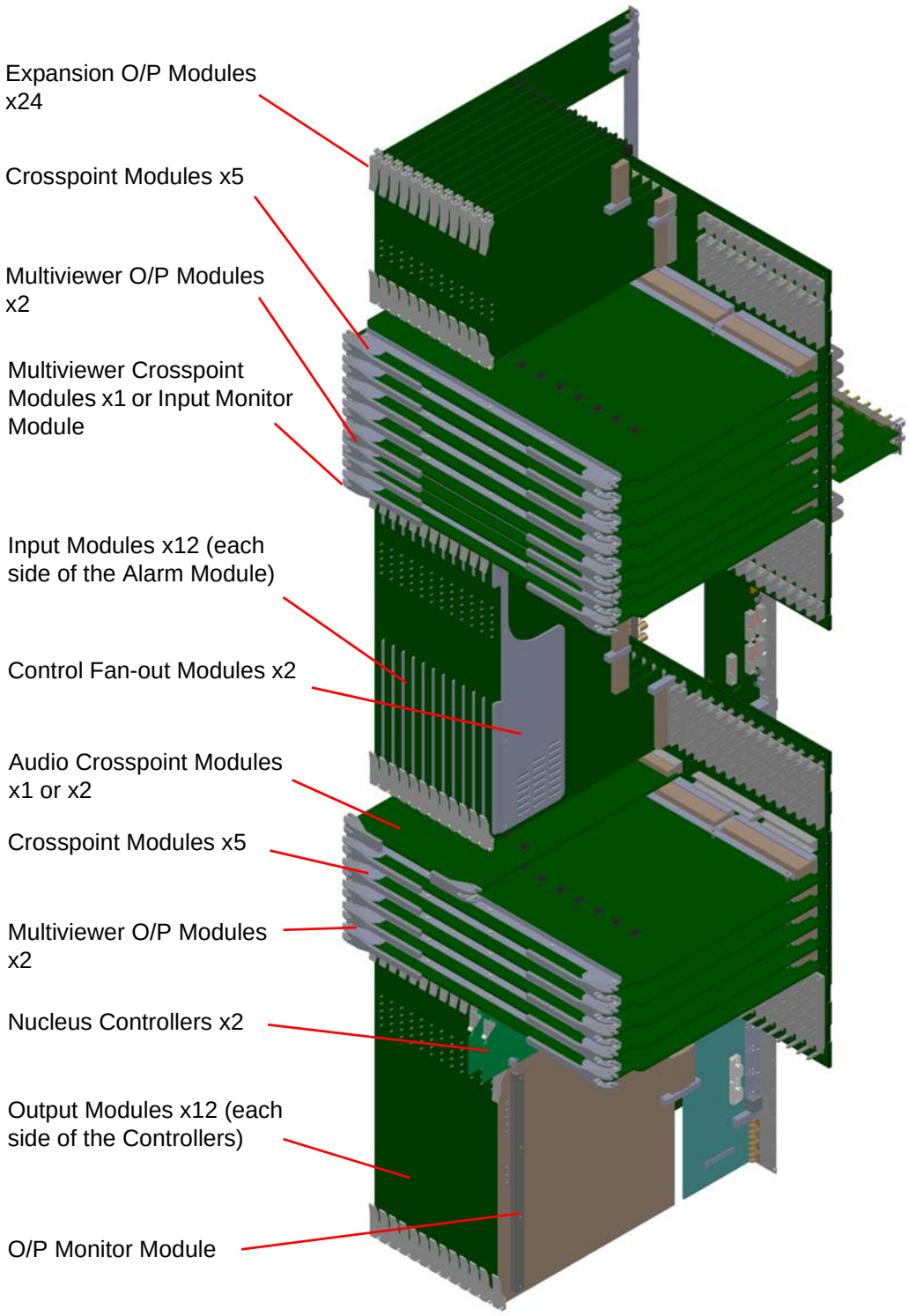
Expansion O/P Modules x24
Crosspoint Modules x5
Multiviewer O/P Modules x2
Multiviewer Crosspoint Modules x1 or Input Monitor Module
Input Modules x12 (each side of the Alarm Module)
Control Fan-out Modules x2
Audio Crosspoint Modules x1 or x2
Crosspoint Modules x5
Multiviewer O/P Modules x2
Nucleus Controllers x2
Output Modules x12 (each side of the Controllers)
O/P Monitor Module

Fig 195. Sirius 850 Card Locations - Front View

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C.2.1.1 Sirius 850 - Controller Module Addresses

Expansion Modules	1	2	3	4	5	6	7	8	9	10	11	12			13	14	15	16	17	18	19	20	21	22	23	24
	145	146	147	148	149	150	151	152	153	154	155	156			157	158	159	160	161	162	163	164	165	166	167	168
XPT 1	198																											
XPT 2	199																											
XPT R [1]	202																											
XPT 3	200																											
XPT 4	201																											
MV Output 1	246																											
MV Output 2	247																											
MV XPT 1	245																											
Input Row and Fan Controllers	1	2	3	4	5	6	7	8	9	10	11	12	1	2	13	14	15	16	17	18	19	20	21	22	23	24
	1	2	3	4	5	6	7	8	9	10	11	12	237	238	13	14	15	16	17	18	19	20	21	22	23	24
Audio XPT	1													2												
	233													234												
XPT 1	193																											
XPT 2	194																											
XPT R[1]	197																											
XPT 3	195																											
XPT 4	196																											
Outputs and Monitor	1	2	3	4	5	6	7	8	9	10	11	12	1		13	14	15	16	17	18	19	20	21	22	23	24
	97	98	99	100	101	102	103	104	105	106	107	108	1		109	110	111	112	113	114	115	116	117	118	119	120

Table 51. Sirius 850 Slot / Module Address Locations

[1] Redundant Crosspoint Module

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C.2.2 Sirius 840 Module Locations

For each router, it is important that the correct module addresses are set in the Workbench controller configuration.

Note: If the auto-configuration option is used, the number and types of module configurations are automatically set. Any modules that are not present or not recognized are identified as **TUnknownModule**.

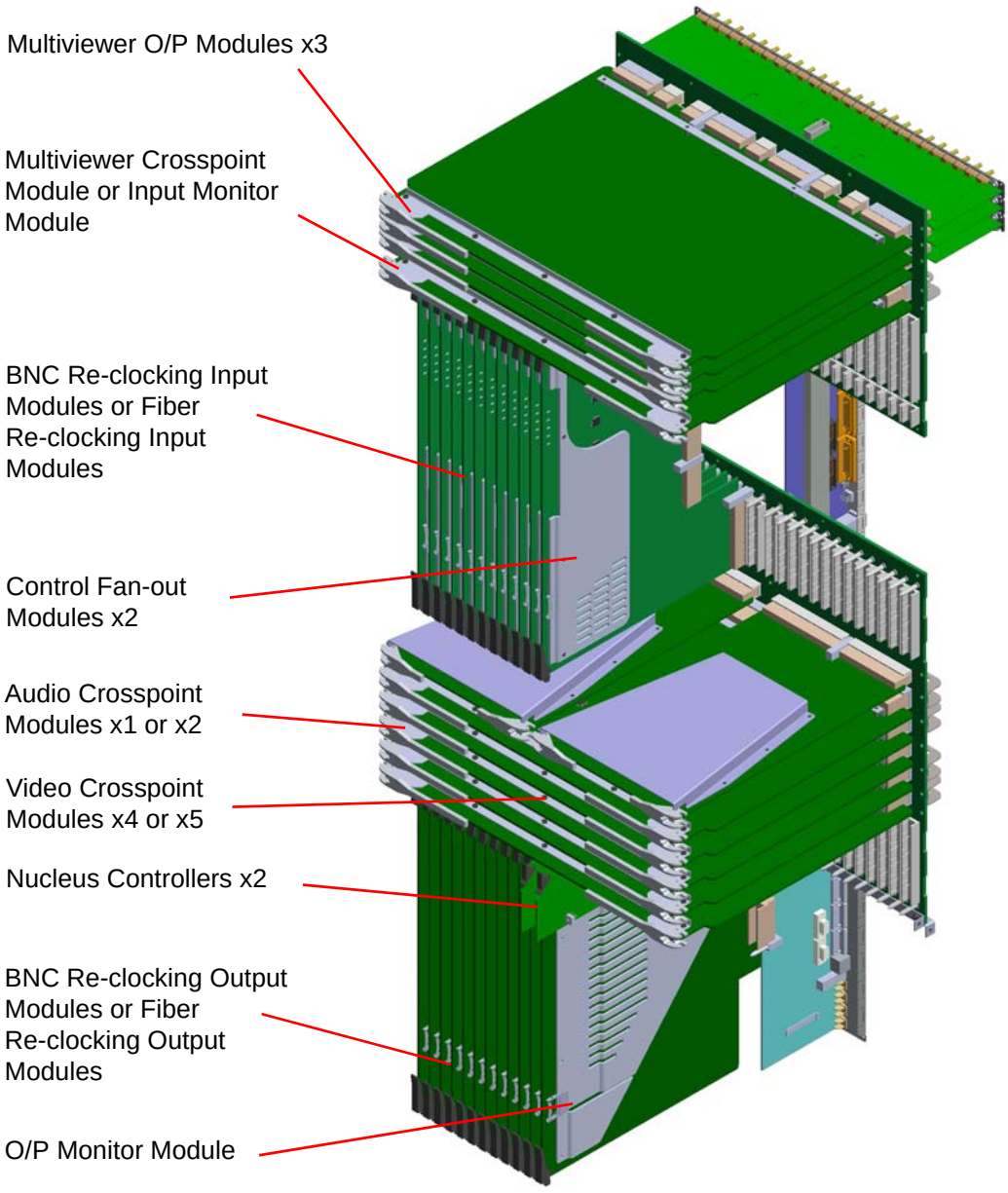
Multiviewer O/P Modules x3
Multiviewer Crosspoint Module or Input Monitor Module
BNC Re-clocking Input Modules or Fiber Re-clocking Input Modules
Control Fan-out Modules x2
Audio Crosspoint Modules x1 or x2
Video Crosspoint Modules x4 or x5
Nucleus Controllers x2
BNC Re-clocking Output Modules or Fiber Re-clocking Output Modules
O/P Monitor Module

Fig 196. Sirius 840 Card Locations - Front View

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C.2.2.1 Sirius 840 - Controller Module Addresses

MV Output 3	248																								
MV Output 2	247																								
MV Output 1	246																								
MV XPT	245																								
Input Row and Fan Controllers	1	2	3	4	5	6	7	8	9	10	11	12	1	2	13	14	15	16	17	18	19	20	21	22	23	24
	1	2	3	4	5	6	7	8	9	10	11	12	237	238	13	14	15	16	17	18	19	20	21	22	23	24
Audio XPT	1													2												
	233													234												
XPT 1	193																								
XPT 2	194																								
XPT R [1]	197																								
XPT 3	195																								
XPT 4	196																								
Outputs and Monitor	1	2	3	4	5	6	7	8	9	10	11	12	1		13	14	15	16	17	18	19	20	21	22	23	24
	97	98	99	100	101	102	103	104	105	106	107	108	1		109	110	111	112	113	114	115	116	117	118	119	120

Table 52. Sirius 840 Slot / Module Address Locations

[1] Redundant Crosspoint Module

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C.2.3 Sirius 830 Module Locations

For each router, it is important that the correct module addresses are set in the Workbench controller configuration.

Note: If the auto-configuration option is used, the number and types of module configurations are automatically set. Any modules that are not present or not recognized are identified as **TUnknownModule**.

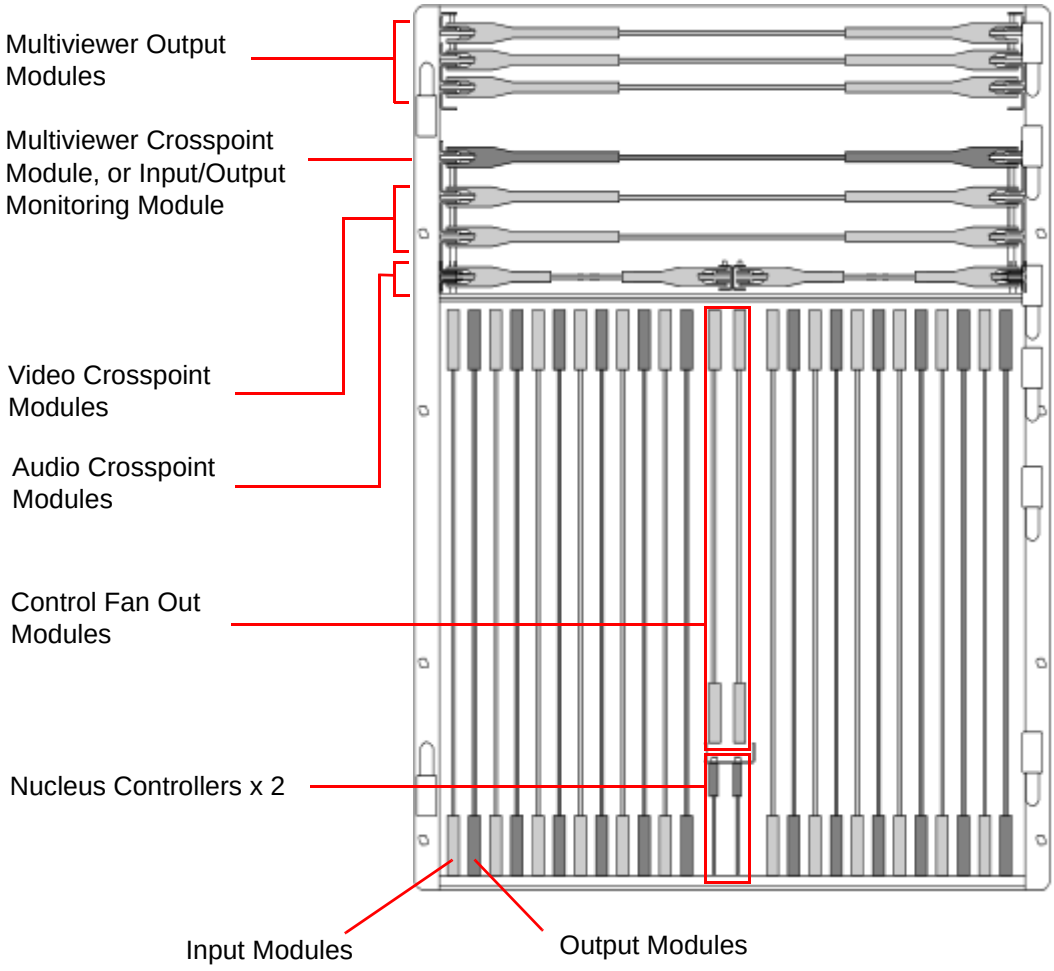

Fig 197. Sirius 830 Card Locations - Front View

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C.2.3.1 Sirius 830 - Controller Module Addresses

MV Output 3	248																									
MV Output 1	247																									
MV Output 2	246																									
MV XPT 1	245																									
XPT R [1]	194																									
XPT M	193																									
Audio XPT	1													2												
	233													234												
Fan Controllers													237	238												
Input and Outputs	1	97	2	98	3	99	4	100	5	101	6	102			7	103	8	104	9	105	10	106	11	107	12	108

Table 53. Sirius 830 Slot / Module Address Locations

[1] Redundant Crosspoint Module

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C.3 Cygnus Routers

C.3.1 Module Locations

For each router, it is important that the correct module addresses are set in the Workbench controller configuration.

Note: If the auto-configuration option is used, the number and types of module configurations are automatically set. Any modules that are not present or not recognized are identified as **TUnknownModule**.

Table 55. shows a summary of the module address ranges.

Module	Address Range (dec)
Inputs	1 to 48 (Top Input row = 1 to 24, Bottom Input Row = 25 to 48)
Outputs	129 to 152
Crosspoints	257 to 260
Monitors	270 to 272
Resilient crosspoints	261 to 264

Table 54. Cygnus Module Address Ranges

Fig 198. shows the Cygnus card locations.

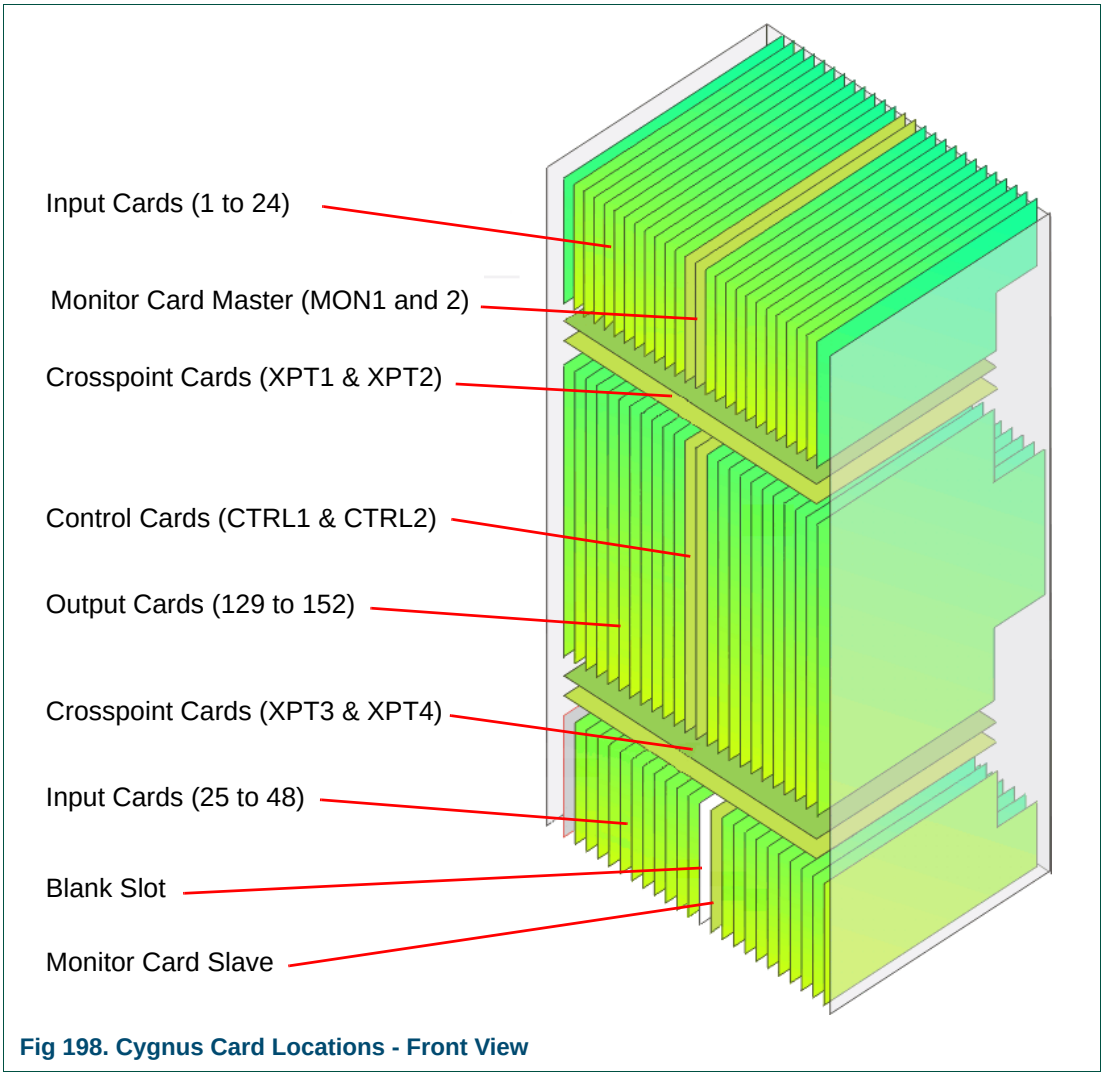
Input Cards (1 to 24)
Monitor Card Master (MON1 and 2)
Crosspoint Cards (XPT1 & XPT2)
Control Cards (CTRL1 & CTRL2)
Output Cards (129 to 152)
Crosspoint Cards (XPT3 & XPT4)
Input Cards (25 to 48)
Blank Slot
Monitor Card Slave

Fig 198. Cygnus Card Locations - Front View

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	Input												MON1	MON2	Input										
Top Input row	1	13	2	14	3	15	4	16	5	17	6	18	270	271	7	19	8	20	9	21	10	22	11	23	12	24
XPT 1	257																									
XPT 2	258																									
	Output												CTRL1	CTRL2	Output										
Output Row	129	141	130	142	131	143	132	144	133	145	134	146	N/A	N/A	135	147	136	148	137	149	138	150	139	151	140	152
XPT 1	259																									
XPT 2	260																									
	Input												SPARE	MON3	Input										
Bottom Input Row	48	36	47	35	46	34	45	33	44	32	43	31	<none>	272	42	30	41	29	40	28	39	27	38	26	37	25

Table 55. Cygnus Slot / Module Address Locations

C.3.2 Example Module IDs…

1 to 24	TDigitalVideoInputModule
25 to 128	TUnknownModule
129 to 152	TDigitalVideoOutputModule
153 to 256	TUnknownModule
257 to 258	TVideoCrosspointModule
259 to 269	TUnknownModule
270 to 271	TDigitalVideoOutputModule
272 to 280	TUnknownModule

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Appendix D. Hardware Panels Reference

D.1 Supported Hardware Panels

D.1.1 1U Panels

Panel	Mode	Description
6705	Split XY	16 sources to 16 destinations with 4 level buttons, protect and panel lock
	4-bus XY	32 sources to 4 destinations, protect and panel lock
	Split BPX	(16 sources to 1 destination) x 2 with 4 level buttons, protect and panel lock
	BPX	32 sources to 1 destination with 4 level buttons, protect and panel lock
6706	Split XY	24 sources to 24 destinations with 4 level buttons, protect and panel lock
	32x16 XY	32 sources to 16 destinations with 4 level buttons, protect and panel lock
	4-bus XY	48 sources to 4 destinations, protect and panel lock
	Split BPX	(24 sources to 1 destination) x 2 with 4 level buttons, protect and panel lock
	BPX	48 sources to 1 destination with 4 level buttons, protect and panel lock
6707	XY	16 sources to 16 destinations with 4 level buttons, protect and panel lock
	Split BPX	(16 sources to 1 destination) x 2 with 4 level buttons, protect and panel lock
6708	XY	24 sources to 12 destinations with 4 level buttons, protect and panel lock
6709	4-bus XY	16 sources to 4 destinations, protect and panel lock
	Split XY	8 sources to 8 destinations with 4 level buttons, protect and panel lock
	Split BPX	(8 sources to 1 destination) x 2 with 4 level buttons, protect and panel lock
	BPX	16 sources to 1 destination with 4 level buttons, protect and panel lock
6736 and 6028000	36x18 X-Y	36 sources to 18 destinations with 4 level buttons, protect and panel lock
	36x36 X-Y	36 sources to 36 destinations with 4 level buttons, protect and panel lock
	72 BPX	72 sources to 1 destination with 4 level buttons, protect and panel lock
6759 and 6028100	18x18 X-Y	18 sources to 18 destinations with 4 level buttons, protect and panel lock
	36BPX	36 sources to 1 destination with 4 level buttons, protect and panel lock

Table 56. Supported 1U Panel Types

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Panel	Mode	Description
6028000 and 7028000	16x16 X-Y BPX	16 sources to 16 destinations with 4 level buttons, protect and panel lock, or 32 sources to 1 destination with 4 level buttons, protect and panel lock
	16x4 X-Y BPX	16 sources to 4 destinations with 4 level buttons, protect and panel lock, or 20 sources to 1 destination with 4 level buttons, protect and panel lock
	24x12 X-Y BPX	24 sources to 12 destinations with 4 level buttons, protect and panel lock, or 36 sources to 1 destination with 4 level buttons, protect and panel lock
	24x24 X-Y BPX	24 sources to 24 destinations with 4 level buttons, protect and panel lock, or 48 sources to 1 destination with 4 level buttons, protect and panel lock
	32x16 X-Y BPX	32 sources to 16 destinations with 4 level buttons, protect and panel lock, or 48 sources to 1 destination with 4 level buttons, protect and panel lock
	32x4 X-Y BPX	32 sources to 4 destinations with 4 level buttons, protect and panel lock, or 36 sources to 1 destination with 4 level buttons, protect and panel lock
	48 way BPX	48 sources to 1 destination with 4 level buttons, protect and panel lock
	48x4 X-Y BPX	48 sources to 4 destinations with 4 level buttons, protect and panel lock, or 52 sources to 1 destination with 4 level buttons, protect and panel lock
	72 way BPX	72 sources to 1 destination with 4 level buttons, protect and panel lock
	Dual 16 split BPX	(16 sources to 1 destination) x 2 with 4 level buttons, protect and panel lock
	Dual 16+16 BPX	16 sources to 2 destinations with 4 level buttons, protect and panel lock
	Dual 24 split BPX	(24 sources to 1 destination) x 2 with 4 level buttons, protect and panel lock
	Dual 8 split BPX	(8 sources to 1 destination) x 2 with 4 level buttons, protect and panel lock
6028100 and 7028100	16x16 X-Y BPX	16 sources to 16 destinations with 4 level buttons, protect and panel lock, or 32 sources to 1 destination with 4 level buttons, protect and panel lock
6028201 and 7028201	16 way BPX	16 sources to 1 destination with 4 level buttons, protect and panel lock
	32 way BPX	32 sources to 1 destination with 4 level buttons, protect and panel lock
	8x8 X-Y BPX	8 sources to 8 destinations with 4 level buttons, protect and panel lock, or 16 sources to 1 destination with 4 level buttons, protect and panel lock

Table 56. Supported 1U Panel Types (Continued)

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D.1.2 2U Panels

Panel	Description
6276-00	All sources to all destinations, 8 level buttons
6276-01	All sources to 1 or 2 destinations (with alt-dest button), 8 level buttons
6277-20	All sources to 2 or 4 destinations (with alt-dest button), 8 level buttons
6277-40	All sources to 4 or 8 destinations (with alt-dest button), 8 level buttons
6277-60	All sources to 6 or 12 destinations (with alt-dest button), 8 level buttons
6277-80	All sources to 8 or 16 destinations (with alt-dest button), 8 level buttons
6026776	As panel 6276-00
6026777	As panel 6277-60 or 6277-80
6026778	As panel 6277-20 or 6277-40

Table 57. Supported 2U Panel Types

D.2 Panel Features

This section describes features encountered across the range of hardware panel types.

Note: Where features relate to panel types 6276 and 6277, the features are also applicable to panels that mimic these panel types.

D.2.1 Special Functions

6276 and 6277 type panels have special functions displayed to the left of the source/dest keypad. These buttons can each be assigned a different function, see Fig 199. See individual panel features for special functions supported.

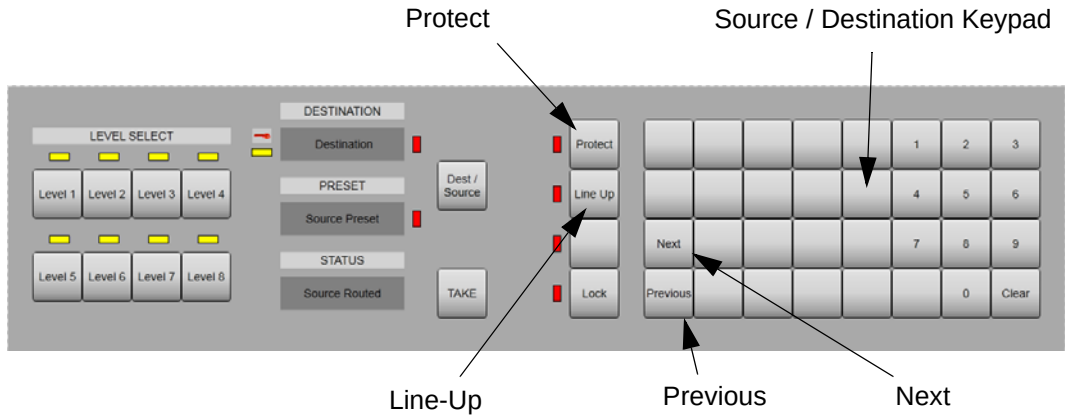

Fig 199. 6276 Panel Special Functions

D.2.2 Protect

Any control panel with a **Protect** button may lock any destination it has access to, which then prevents any device using the same control system from changing that destination. The only exception to this is a 'Master' panel. Any panel type may have a Protect button assigned; with 6276 and 6277 panels the function must be assigned to one of the special function buttons.

Protect operates on the destination assigned to each level for the destination association that was protected.

If a control device attached to the multi-drop device ports attempts to set crosspoints on a protected destination then an error message is shown on control devices with displays.

If they are assigned to the same destination, setting a protected destination causes protect button LEDs on other BPX type panels to flash.

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D.2.3 Line-up

This is a continuous toggle (once a second) of the preset and program sources to the selected destination, allowing easy comparison of sources. This is only available on 6276 and 6277 panels using the special function buttons. Line-up of sources is selected as follows:

- Route source to be aligned to desired destination.
- Make sure the level of the sources to be aligned is the most significant active level.
- Select reference source as the preset source.
- Press **LINE-UP** button on panel. The LED associated with the **LINE-UP** button lights up to indicate that the button has been pressed.
- Press **TAKE** button of desired destination. The source routed toggles between the reference source and the source to be aligned.
- Line-up of sources on a destination is cancelled by pressing the **LINE-UP** button again. This cancels line-up altogether on the control device.
- The source being aligned is returned as the source routed to the destination being used and also the LED associated with the **LINE-UP** button is extinguished.
- Pressing another **TAKE** button on the same panel causes the original source to be routed to the previous destination and then start the line-up sequence on the new destination.

Note: All control devices power-up with line-up inactive.

D.2.4 Next and Previous

Each time the **NEXT** or **PREVIOUS** button is pressed, the source or destination association number selected, depending on the active keypad, is increased or decreased. The panel displays are updated accordingly. These functions only work on 6276 and 6277 panels.

D.2.5 Alt-dest

ALT-DEST allows a 6277 multi-destination panel to access more destinations than are usually configured, that is, one per status display. When pressed, the panel changes control to the alternate set of assigned destination associations configured in the database. When the LED to the left of the ALT-DEST button is illuminated, the panel is then controlling the second set of destination associations assigned to the panel. This function must use a special function button.

D.2.6 Dest-ident

The **DEST-IDENT** button is used to identify the destination associations assigned to the **TAKE** buttons on a 6277 multi-destination panel. Pressing and holding down the **DEST-IDENT** button changes the STATUS to show the 8-character name for the assigned destination association for the current set of destination associations. This button is especially useful when an **ALT-DEST** button has been assigned.

D.2.7 Level Buttons

Many panel types have level buttons in their configuration. These allow ‘breakaway’ route selections to be made, that is, routes that are made by selecting parts of an association.

Each button operates in a toggle on/off manner with the level button active indicated by an illuminated button, or associated LED/lamp. The levels that each button controls are individually configurable.

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D.2.8 Alt-lev

The Alternate level shift function is used on panels where there are more levels than level buttons, allowing individual control of all levels. It operates in a toggle on/off manner with an LED/lamp used to indicate the level shift - when the LED/lamp is off then the non-shifted levels are controllable and when the LED/lamp is on the shifted levels are controllable.

The level shift function is button programmable on all panel types (BPX and X-Y). Any source or destination button can be configured as a level shift button.

D.2.9 Clear

This key is used as a source preset or destination clear key and is generally assigned to the bottom right key on the keypad of a 6276 or 6277 panel.

D.2.10 Controllable Destinations

This applies to X-Y panels only. Any destination can be configured to be controllable (default) from a given X-Y panel. Routes may be viewed but cannot be changed.

D.2.11 Destination Keypads

All X-Y style panels have a destination keypad. This is either button-per-destination (BPD) as on 1U XY panels, or dial-up (multiple button presses) as on 6276 panels. These are configured in the database.

Press a destination button (BPD) or a sequence of buttons (dial-up) to select a destination association. The advantage of a dial-up keypad is that many more destinations may be accessed from the same size keypad.

The pressed button either illuminates if it has a valid associated destination association index, or has alphanumerics to display the name of the selected destination association.

On power-up no destination button is selected, so all destination buttons are extinguished, and any destination displays on X-Y panels are blank.

D.2.12 Source Keypads

All control panels have a source keypad. This is either a button-per-source (BPS) as on 1U panels or dial-up (multiple button presses) as on 6276/6277 panels. These are configured in the database.

Press a source button (BPS) or a sequence of buttons (dial-up) to select a source association. The advantage of a dial-up keypad is that many more sources may be accessed from the same size keypad.

The source keypads on 6276/6277 panels are used to pre-select sources, not route them. These panels have <TAKE> buttons to confirm the selections.

The pressed button either illuminates if it has a valid associated source association index, or has alphanumerics to display the name of the selected source association.

D.2.13 Panel Swap Mode

Panel Swap Mode is available for 6276 and 6277 panels. When activated in the database, it causes the taken source and the preselected source to swap, or interchange, and therefore allows the previously taken source to be re-routed with another **TAKE**. This could be considered to be an undo facility, for quickly reverting to the previous selection.

This feature is currently supported on a 2450 controller only.

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D.2.14 Override Salvo Protects

This mode is only available for the 6276 XY panel, and is configured in the panel details. When enabled, any Salvos fired from this panel overrides any system protects, from whatever source they have been applied. This ensures that all crosspoints configured in a Salvo is always set. Enabling this mode automatically enables the Master mode.

This feature is not currently supported.

D.2.15 Mask with Destination

This mode is available with all XY panels, including the 6276 and any 6700 series panels configured as XY and is configured in the panel properties. When enabled, any destination assigned to the panel that does not have a primary level association indicates this by flashing the primary level panel lamp, and showing the next active level source in the status display.

This feature is not currently supported.

D.2.16 Display Audio Parameters

This feature can be applied to 6276 X-Y and 6277 multi-bus panels only. It is enabled by assigning one of the special function buttons to be of the **DISPLAY AUD** type. When pressed, source and destination audio parameters are indicated by the eighth character in the source and destination displays for the most significant stereo Analogue Audio level in the system, this may require the level buttons to be toggled on or off in order to show the desired audio level.

This feature is currently supported on a 2450 controller only.

Table 58.defines the symbols used.

Symbol	Description
Space	Indicates normal source or destination
Steady ‘S’	Indicates destination is Swapped
Steady ‘M’	Indicates destination is Mono
Flash ‘N’ and ‘?’	Normal destination pre-selected
Flash ‘S’ and ‘?’	Swapped destination pre-selected
Flash ‘M’ and ‘?’	Mono destination pre-selected
Flashing ‘L’	Left channel of source routed to both channels
Flashing ‘R’	Right channel of source routed to both channels
Flashing ‘S’	Left and right channels swapped
NRM or NRM?	Source is Normal or pre-selected to be Normal
L-R or L-R?	Source is L-R or pre-selected to be L-R
R-L or R-L?	Source is R-L or pre-selected to be R-L
SWP or SWP?	Source L/R swapped or pre-selected to be L/R swapped
525 or 525?	Source using 525 trigger or pre-selected to use 525
625 or 625?	Source using 625 trigger or pre-selected to use 625
Steady ‘→’	No audio parameters on current most significant active level but other levels configured with audio parameters
Flashing ‘→’ with ‘?’	No audio parameters pre-selected on most significant active level but other levels configured with audio parameter pre-selected
TRG?	No source pre-select on level thus unknown trigger
AUP?	No source pre-select on level thus unknown audio parameter

Table 58. Audio Parameters

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D.2.17 Configure Audio Parameters

This feature can be applied to 6276 X-Y and 6277 multi-bus panels only. It is enabled by assigning one of the special function buttons to be of the <CONFIG AUD> type. When pressed, not only are the source and destination audio parameters indicated by the eighth character of the display, as in the previous table, but they may also be changed. When enabled this feature allows pre-selection of destination AUD parameters for stereo analogue audio levels. If panel is a Master 6276 X-Y then enabling this feature allows AUD parameters to be assigned to sources and destinations and allows trigger type to be assigned to sources.

This feature is currently supported on a 2450 controller only.

D.2.18 Override Inputs

Some panels allow a number of override inputs to momentarily override the current source routed to a destination with another source.

When all overrides are released the original source that was routed before any overrides were activated is restored. Shorting an override input pin to 0 V, activates the override.

Each override input can have any source assigned to it and can be assigned to operate on any level. If more than one override input is active on a panel, then the lowest number override has priority.

When a destination is overridden no other crosspoint can be set on that destination by any means unless it is a higher priority override.

The maximum number of overrides available to a panel is 16. Current supported panel s have 8 or 12 overrides available.

D.2.19 Panel Lock

Most panels have the ability to disable the takes, keypads and **TAKE** keys.

This can be done either using a panel lock button, or by connecting a key switch or similar to the remote panel disable input.

Lock Button

The position of the panel lock button is set in the database configuration. It will also have an associated LED/lamp.

Toggling the Lock button changes the panel between locked and unlocked with its associated LED/lamp illuminating to indicate the state (ON = panel locked).

Remote Panel Disable Input

The remote panel disable input is enabled in the database panel configuration.

The system detects a locked panel through pin 8 of the Overrride (AUX) inputs located on the socket connector on the rear of the panel.

To lock the panel pin 8 needs to be connected to 0 V.

Operation

When the panel is locked, the associated lock button LED/lamp is illuminated, and for panels with alphanumeric displays, the Preset display indicates ‘LOCKED!’ The panel is thus prevented from pre-selecting and routing sources.

The Panel Disable Input takes priority over the lock button on the front, and whilst the Panel Disable Input is active the Lock button has no action.

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D.2.20 Making selections

'Crosspoint' selections (or routes) are made provided:

- The destination and source are valid for the level
- The destination is controllable
- The level is active and controllable
- The route is not inhibited
- Destination is not protected
- An override is not active on this destination unless the source is a higher priority override

D.2.21 Panels with Displays

6276 and 6277 panels have alphanumeric displays for 8-character messages. The table below defines warning messages used throughout the range.

Valid source selections are shown on ‘PRESET’ or ‘STATUS’ displays as defined by:

- ‘SSSSSSSS’ for 8-character.
- ‘PRESET’ warning messages are enclosed by ?. . . . ?
- ‘STATUS’ warning messages are enclosed by <. . . . >

Message	Explanation
‘<No Dst>’	No destination association selected
‘<No Src>’	No source selected because no destination assigned for any level in destination association
‘<↓↓↓↓>’	No destination assigned in the selected destination association on the most significant active level, but there are destinations on the lower levels
‘<↑↑↑↑>’	No destination assigned in the selected destination association on the most significant active level, but there are destinations on the upper levels
‘<--¯¯>’	No destination assigned in the selected destination association on the most significant active level, but there are destinations on the upper and lower levels
‘?No Src?’	Source association with no sources on any level has been selected
‘*LOCKED*’	Panel <TAKE> button and source buttons are disabled via lock button or remote panel disable
‘**PROT**’	Source cannot be routed as destination is protected. After a few seconds the panel name is displayed before reverting back to showing the current source routed a few seconds later
‘PROTECT?’	When flashing, it indicates that destination is protected on the next take
‘*OVRIDE*’	Source cannot be routed as destination has overridden source routed. After a few seconds the name of the device responsible for the override is displayed before reverting back to showing the current source routed or preset a few seconds later
‘ROUTE INH’	Source cannot be routed as route inhibited. Displayed in Preset display
‘?↓↓↓↓?’	No source preselected on the most significant active level, but there are sources preselected on the lower levels
‘?↑↑↑↑?’	No source preselected on the most significant active level, but there are sources preselected on the upper levels

Table 59. Panels with Displays

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Message	Explanation
'?↑↑↓↓?'	No source preselected on the most significant active level, but there are sources preselected on the higher and lower levels
'SALVO'	Displayed in STATUS or IN-USE displays to indicate that a salvo has been preselected
'NO XPT!'	Error message displayed in STATUS or IN-USE to indicate that a crosspoint cannot be set as card not present
'LEV CON'	Error message displayed in STATUS or IN-USE to indicate that a crosspoint was not made on a level because the level was not controllable from that panel
'DST CON'	Error message displayed in STATUS or IN-USE to indicate that a crosspoint was not made because the X-Y panel attempting to set it is not allowed to control the destination

Table 59. Panels with Displays

The brightness of displays on applicable panels may be changed by reconfiguring the database. It is not possible to have different brightness levels for different displays on the same panel.

D.3 Audio Modify/Video Reference Operations

D.3.1 Common Rules

While 'config AUD parameters' is enabled then only AUD parameters can be pre-selected (i.e. sources and destinations cannot be dialled up). Press **<CLEAR>**, while in this mode to return the panel to its previous state.

If the 'display audio parameters' function is disabled then full 8-character names is displayed with no AUD parameter, even if the first level is Analogue Audio.

Selecting 'display audio' function results in the eighth character of the displays showing the AUD parameter assigned for the most significant active level.

Assuming 'display audio parameters' is enabled then:

The eighth character in PRESET and STATUS displays is:

- Steady (non-flashing) when source AUD parameter is NORMAL
- Flashing when source AUD parameter is NOT NORMAL, for example, SWAP

Eighth character in PRESET window displays AUD parameter of the pre-selected source displayed for the most significant active level in the system.

Eighth character in STATUS displays AUD parameter of combined source and destination taken for the most significant active level.

Eighth character in DESTINATION displays the destination AUD parameter of the destination displayed for the most significant active level in the system.

If **<CONFIG AUDIO>** is pressed to enable configuration of AUD parameters and no buttons are pressed within a 1 minute time-out period then this function is automatically disabled and the panel is returned to its previous state.

Enabling configuration of audio parameters always results in 'display audio parameters' being enabled.

The 'N' character to denote Normal is only used in AUD parameter pre-selecting. Usually eighth character is left blank to denote Normal.

If pre-selected route is found to be inhibited (from either editable route inhibit table or internal system inhibit table) then the destination AUD parameter pre-selected is thrown away.

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If a route is protected then AUD parameters and trigger type cannot be changed.

D.3.2 Rules for 6276 X-Y Panels (not designated master)

Only Destination AUD parameters can be assigned from this panel type.

Eighth character in DESTINATION display is also used to show the pre-selected destination AUD parameter when character alternating with '?'.

Enabling configuration of AUD parameters by pressing <CONFIG AUDIO> always results in selector LED being lit against DESTINATION display.

Operation 1:

Press **<DISPLAY AUDIO>** to enable audio parameters to display (optional).

Select DESTINATION display.

Dial up destination (for example, VT 3)

Press **<CONFIG AUDIO>** (selector LED lit against DESTINATION display) followed by the required AUD parameter. The pre-selected AUD parameter is displayed (flashing alternately with '?') in the eighth character of the DESTINATION display.

Press <TAKE> to:

- Assign AUD parameter to destination
- Update eighth character of DESTINATION display to indicate new AUD parameter
- Update eighth character of STATUS display with combined source and destination AUD parameter
- Auto cancel ‘config AUD parameters’ mode

Operation 2:

Press **<DISPLAY AUDIO>** to enable audio parameters to display (optional).

Select DESTINATION display (selector LED lit against DESTINATION display)

Dial up destination (for example, VT 3)

Select PRESET display (selector LED lit against PRESET display)

Dial up a source (for example, VT 7)

Press **<CONFIG AUDIO>** (selector LED lit against DESTINATION display) followed by an AUD parameter. The pre-selected AUD parameter is displayed (flashing alternately with '?') in the eighth character of the DESTINATION display.

Press **<TAKE>** to:

- Assign AUD parameter to destination
- Update eighth character of DESTINATION display to indicate new AUD parameter
- Update eighth character of STATUS display with combined source and destination AUD parameter
- Auto cancel ‘config AUD parameters’ mode

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D.3.3 Rules for 6277 Multi-output Panels

Only Destination AUD parameters can be assigned from this panel type.

When DEST-IDENT activated the eighth character in STATUS displays AUD parameter of the destination for the most significant active level in the system.

Eighth character in PRESET display normally displays AUD parameter of the pre-selected source displayed for the most significant active level in the system. It is also used to show the pre-selected destination AUD parameter.

Operation 1:

Press **<DISPLAY AUDIO>** to enable audio parameters to display (optional).

Clear PRESET display.

Press **<CONFIG AUDIO>** and select an AUD parameter. An 8-character name is displayed in the PRESET display to indicate destination AUD parameter pre-selected.

Press **<TAKE>** to:

- Assign AUD parameter to destination
- Update eighth character of STATUS display with combined source and destination AUD parameter
- Auto cancel ‘config AUD parameters’ mode and blank PRESET display

Operation 2:

Press **<DISPLAY AUDIO>** to enable audio parameters to display (optional).

Dial up source in PRESET display.

Press **<CONFIG AUDIO>** and select an AUD parameter. The pre-selected AUD parameter is displayed (flashing alternately with '?') in the eighth character of the PRESET display.

Press **<TAKE>** to:

- Assign AUD parameter to destination
- Update eighth character of STATUS display with combined source and destination AUD parameter
- Revert to showing source AUD parameter in eighth character of PRESET display
- Auto cancel ‘config AUD parameters’ mode

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Appendix E. Control Behaviors

E.1 Panel Behaviors

A Panel can be set to Hardware Panel behavior, or Soft Panel Behavior.

For Hardware Panels, the following Panel Type behaviors are available:

Behavior	BPXPanel	XY BPXPanel	XY6276Panel	MultiBusPanel	MonitorBusPanel
Auto Display Tally	x	x	x		
Dest Delegate				x	
Dest Soft Assign				x	
Display Source Assoc Name				x	
GPI Panel Lock	x	x	x	x	
Level Button Operation				x	
Log Takes	x	x	x	x	
Mask Levels With Dest		x	x		
Master Panel		x	x		
Override Salvo Protects		x	x		
Swap Mode			x	x	
Use Salvos	x	x	x	x	
Use Tielines	x	x	x	x	

For Soft Panels, Design controls such as buttons, sliders, and so on, must first be allocated to a group, so that relevant control behaviors can be attributed to them.

The Group that a design control is allocated to defines which behaviors are available and can be applied to that control.

E.2 Design Controls

E.2.1 Tab Control

A Tab Control has a passive behavior for all Groups.

E.2.2 Titled Box

A Titled Box has a passive behavior for all Groups.

E.2.3 Button

Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panel BPX	Hardware Panel MultiBus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	MultiViewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Add						x																			
Alarm	x																								

Table 60. Button Behaviors

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Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panel BPX	Hardware Panel MultiBus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	MultiViewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Alarm Screen	x																								
Alarm Screen Alias	x																								
Alarm Set	x																								
Alt Dest									x	x	x	x													
Alt Level									x	x	x	x													
Application	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
Assign Alias				x	x											x	x					x			
Audio Modify		x		x	x									x						x		x			
Base OID			x				x	x																	
Block Select													x												
BPX															x					x					
Break In													x												
Button Select Layout																		x							
Call Function			x				x	x																	
Clear									x	x	x	x													
Clear Routing Selection					x																x				
Clear Selection								x													x				
Clear Tie-line															x	x	x								
Config Audio									x	x	x	x													
Connect Start to End						x																			
Copy Value Behavior			x				x	x																	
Cue Clip																			x						
Cue To																			x						
DCCP Behavior			x				x	x																	
DCCP Wildcard Behavior			x				x	x																	
Delegate									x	x	x	x													
Dest Assign									x	x	x	x													
Dest Group				x																					
Dest Ident									x	x	x	x													
Dest Match									x	x	x	x													
Dest Source Select									x	x	x	x										x			
Dest Track					x																				
Destination				x	x				x	x	x	x		x		x	x					x	x		
Destination Alias				x	x											x	x						x		
Dial Up			x					x		x		x										x			
Dial Up Enter																						x			
Display Audio									x	x	x	x													
Duration																			x						
Enqueue																							x		
Exit Run-mode	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
Extended Page			x				x	x																	
Goto Page				x	x												x			x		x			

Table 60. Button Behaviors

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Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panel BPX	Hardware Panel MultiBus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	MultiViewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Group Preset				x																					
Information													x												
Input Monitor Source Selection				x	x																	x	x		
Insert													x											x	
Jog																			x						
Level		x		x	x				x	x	x	x		x	x	x	x				x	x	x		
Line Up									x	x	x	x													
Married Lamp									x	x	x														
Mon Dest Select									x	x	x	x													
Monitor						x							x												
Monitor Matrix																					x				
Monitor On													x												
Monitor Row		x		x	x																x	x			
Multi-Set			x				x	x																	
Navigate Back	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
Next									x	x	x	x													
Next Chain													x												
Next Page			x	x	x		x	x							x		x			x		x			
Out of Service													x												
Output Monitor Source Selection				x	x																	x	x		
Page Index Preset Clear			x				x	x																	
Page Index Preset Enter			x				x	x																	
Page Index Preset Key			x				x	x																	
Panel Lock	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Passive (default)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Pause																			x						
Play																			x						
Preset All				x	x																				
Previous									x	x	x	x													
Previous Chain													x												
Previous Page			x	x	x		x	x							x		x			x		x			
Protect				x	x				x	x	x	x					x					x			
Protect Lamp									x	x	x														
Recall Position																			x						
Refresh		x																							
Refresh Clips																			x						
Remove						x							x										x		
Replace						x							x										x		
Reverse Chain Tested													x												
Route													x												
Salvo				x	x				x	x	x	x		x						x		x			

Table 60. Button Behaviors

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Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panel BPX	Hardware Panel MultiBus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	MultiViewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Salvo & Screen																							x		
Salvo Snapshot				x	x									x							x		x		
Salvo Toggle				x	x									x							x		x		
Screen	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
Screen Alias	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
Select From Monitor		x																							
Select Play Port																			x						
Selected Alarm	x																								
Shuttle																			x						
Snapshot Editor		x		x	x									x							x		x		
Snapshot Run		x		x	x									x							x		x		
Snapshot Save		x		x	x									x							x		x		
Source				x	x				x		x			x		x	x						x		
Source Alias				x	x											x	x						x		
Source Group				x																					
Source Select																								x	
Source Track					x																				
Stop																			x						
Store Position																			x						
Tab Page	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
Take		x		x	x			x	x	x	x	x				x	x					x	x		
Take Next									x	x	x	x												x	
Take Previous									x	x	x	x													
Toggle Button Behavior			x			x	x																		
Track Preset					x																				
Undo Take		x		x	x									x	x	x	x				x	x	x		
VAR																			x						

Table 60. Button Behaviors

E.2.4 CheckBox

The CheckBox control is only valid as DCCP behavior for the Generic and Generic Dial-up Groups. The CheckBox sets a value in a DCCP field to TRUE or FALSE.

Note: The DCCP field must be a text field, such as a Name, UseLastRunViewChanges or StringValue. If the DCCP field is set to change a DoubleValue field, an error displays at runtime.

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E.2.5 Combo Box

Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panel BPX	Hardware Panel Multi Bus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	Multi Viewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Active Alarms	x																								
DCCP behavior			x				x	x																	
Device Chain End Device						x																			
Device Chain End Device Input						x																			
Device Chain Start Device						x																			
Device Chain Start Device Output						x																			
Forward Tally		x	x	x	x									x							x		x		
Passive (default)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Screen List	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
Selected Clip																				x					
Selected Layout																		x							
Selected Playout Device																				x					
Snapshot List		x		x	x									x							x		x		

Table 61. Combo Box Behaviors

E.2.6 Edit Button

The Edit Button control is only valid as DCCP behavior for the Generic and Generic Dial-up Groups. The Edit Button sets a value in a DCCP field to a text value.

Note: The DCCP field must be a text field, such as a Name, UseLastRunViewChanges or StringValue. If the DCCP field is set to change a DoubleValue field, an error displays at runtime.

E.2.7 Image

Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panel BPX	Hardware Panel Multi Bus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	Multi Viewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Alt Dest									x	x	x	x													
Alt Level									x	x	x	x													
Config Audio									x	x	x	x													
Delegate									x	x	x	x													
Dest Assign									x	x	x	x													
Dest Source Select									x	x	x	x													
Dest Source Select Tally																						x			
Display Audio									x	x	x	x													
Image Tally			x				x	x																	x

Table 62. Image Behaviors

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Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panel BPX	Hardware Panel Multi Bus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	Multi Viewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Level									x	x	x	x													
Line Up									x	x	x	x													
Married Lamp									x	x	x	x													
Married Tally				x	x												x					x			
Panel Lock									x	x	x	x													
Passive (default)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Protect									x	x	x	x													
Protect Lamp									x	x	x	x													
Protect Tally				x	x												x					x			
Tracks Married					x																				

Table 62. Image Behaviors

E.2.8 Line

Line can be added to interconnect elements, or add defining regions. The line control is passive only.

E.2.9 List Box

Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panel BPX	Hardware Panel Multi Bus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	Multi Viewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Active Alarms	x																								
Alarm Events	x																								
Audio Destination Delays		x																							
Audio Destination Gains		x																							
Audio Destination Signal Rate Conversion		x																							
Audio Destination Swaps		x																							
Audio Source Gains		x																							
Audio Source Swaps		x																							
Crosspoint Destination Tracks		x																							
Crosspoint Source Tracks		x																							
DCCP behavior			x				x	x																	x
Device Chain End Device						x																			
Device Chain End Device Input						x																			
Device Chain Start Device						x																			
Device Chain Start Device Output						x																			

Table 63. List Box Behaviors

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Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panel BPX	Hardware Panel Multi Bus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	Multi Viewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Forward Tally		x		x	x									x							x	x	x		
Passive (default)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Property Selection																									x
Router Destination Names		x																							
Router Destination Out Pins		x																							
Router Source In Pins		x																							
Router Source Mames		x																							
Screen	x																								
Screen List		x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
Selected Clip																				x					
Selected Layout																		x							
Selected Playout Device																				x					
Snapshot List		x		x	x									x							x		x		
Video Destination Delays		x																							
Video Destination Gains		x																							
Video Destination Origin Types		x																							
Video Destination Shuffle		x																							
Video Source Delays		x																							
Video Source Gains		x																							
Video Source Origin Types		x																							
Video Source Shuffle		x																							

Table 63. List Box Behaviors

E.2.10 Edit Box

Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panels BPX	Hardware Panel Multi Bus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	Multi Viewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Base OID Value			x				x	x																	
Cue To																				x					
DCCP behavior			x				x	x																	x
Duration																				x					
Page Index			x																						
Passive (default)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Property List Editor			x				x	x																	x
Selected Clip																				x					

Table 64. Edit Box Behaviors

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E.2.11 Label

Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panels BPX	Hardware Panel Multi Bus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	Multi Viewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Active Chain													x												
Base OID Value			x				x	x																	
Block Information													x												
Chain Count													x												
Controller Active	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
Controller Connection	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
Cue To																			x						
DCCP behavior			x				x	x																	
Destination Main Signal Name		x																							
Destination Main Signal Pin		x																							
Dial Up Selection Tally																					x				
Duration																			x						
Forward Tally		x		x	x									x						x	x	x			
Get Position																			x						
Group Preset Tally				x																					
Group Tally				x																					
Local Time [1]	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
Monitor Tally		x		x	x																x	x			
Page Index			x				x	x																	
Page Index Preset			x				x	x																	
Page Number				x	x										x		x			x		x			
Passive (default)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Prompt Message													x												
Routed Monitoring Point Tally						x																			
Selected Destination		x																							
Selected Layout																		x							
Selected Source		x																							
Selection Tally				x	x			x									x				x	x		
Source Main Signal Delay		x																							
Source Main Signal Frame Sync		x																							
Source Main Signal Line Sync		x																							
Source Main Signal Name		x																							
Source Main Signal Pin		x																							
Target Block													x												
Text Display									x	x	x	x													
Text Tally				x	x									x	x	x	x			x	x	x			
Track Preset Tally					x																				
Track Tally					x																				

Table 65. Label Behaviors

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Behavior	Alarm	Audio Path	Audio Processing	Audio Router XY Group	Audio Router XY Track	Device Chain	Generic	Generic Dial Up	Hardware Panels BPX	Hardware Panel Multi Bus	Hardware Panel XY	Hardware Panel XY6276	Mimic	Multi Bus	Multi Matrix BPX	Multi Matrix Multi Bus	Multi Matrix XY	Multi Viewer Device	Passive (default)	Playout Device	Router BPX	Router Dial Up	Router XY	Source Queue	Tag Name Editing
Undo Tally				x	x										x	x	x					x	x		
Version Info	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x

Table 65. Label Behaviors

[1] Pre-defined times, or Microsoft custom date and time format strings.

E.2.12 Composite Slider

The Composite Slider control is only valid as DCCP behavior for the Generic and Generic Dial Up Groups.

E.2.13 Slider

The Slider control is only valid as DCCP behavior for the Generic and Generic Dial Up Groups.

E.2.14 Up Down

The Up Down control is only valid as DCCP behavior for the Generic and Generic Dial Up Groups.

E.2.15 Hyperion Thumbnail

The Hyperion Thumbnail control is valid for all Groups.

E.2.16 Jog Shuttle

The Jog Shuttle control is only valid for the Playout Device Group. The available behaviors are:

- Cue Clip
- Cue To
- Jog
- Pause
- Play
- Shuttle
- Stop
- VAR

E.2.17 List Buttons

The List Buttons control is only valid as DCCP behavior for the Generic and Generic Dial Up Groups.

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E.2.18 Media Player

The Media Player control is valid for all Groups except Hardware.

E.2.19 Radio Buttons

The Radio Buttons control is only valid as DCCP behavior for the Generic and Generic Dial Up Groups.

E.2.20 Source Queue

The Source Queue control is only valid as a Source Queue behavior for the Source Queue Group.

E.2.21 Web Browser

The Web Browser control is valid for all Groups.

E.2.22 Bar Meter

The Bar Meter control is only valid as DCCP behavior for the Generic and Generic Dial Up Groups.

E.2.23 Line Graph

The Line Graph control is only valid as DCCP behavior for the Generic and Generic Dial Up Groups.

E.2.24 Round Gauge

The Round Gauge control is only valid as DCCP behavior for the Generic and Generic Dial Up Groups.

E.2.25 Device Selector

This Device Selector control is only valid as Block Select behavior for the Mimic Group.

E.2.26 Mimic Box

The Mimic Box control is only valid as a Mimic Forward Chain, and Mimic Backward Chain behaviors for the Mimic Group.

E.2.27 Device Chain Box

The Device Chain control is only valid as a Device Chain behavior for the Device Chain Group.

E.2.28 Device Selector

This Device Selector control is only valid as Device Selector behavior for the Device Chain Group.

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Appendix F. Databases

F.1 SQL Server Management Studio

F.1.1 Restore a Database

Note: Before restoring a database, ensure that the current database has been backed up first.

The Workbench CD contains several optional example databases. If the example databases are installed, they are installed in the Workbench installation folder... \Workbench\Databases

To install a new database:

1. Make sure Workbench is not active.
2. If necessary, copy **.bak** file to the computer.
3. Open SQL server management express and connect to the server using the following:

   Login: WorkbenchUser

   Password: probel

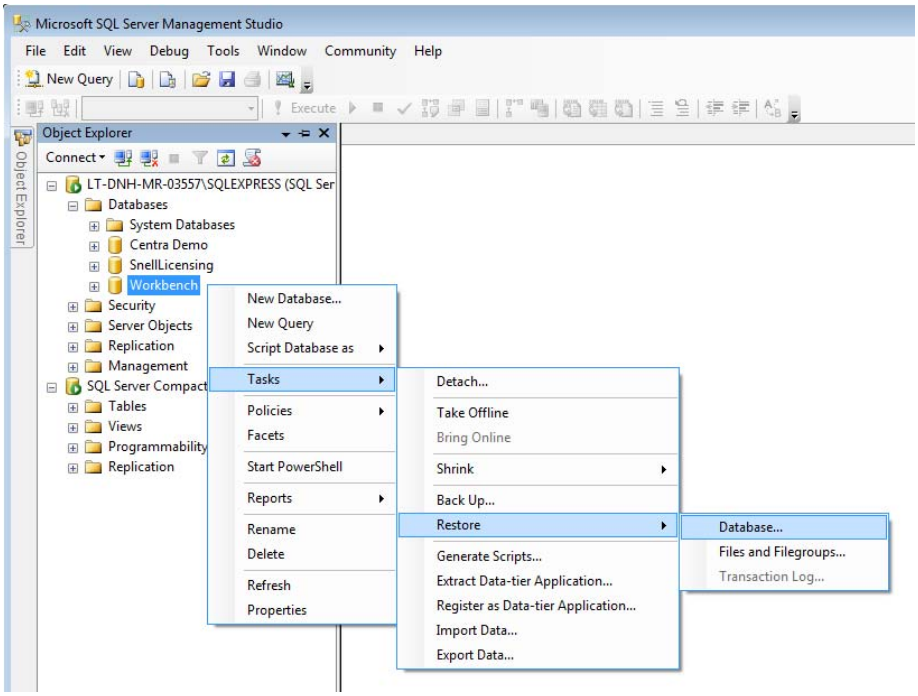

Fig 200. SQL Log-in

4. Right-click on the Workbench database and select **Tasks | Restore | Database**

   The **Restore Database - Workbench** screen displays. This screen has two pages selectable from the Select a page area at the top-left of the screen. By default the **General** page is open on startup.

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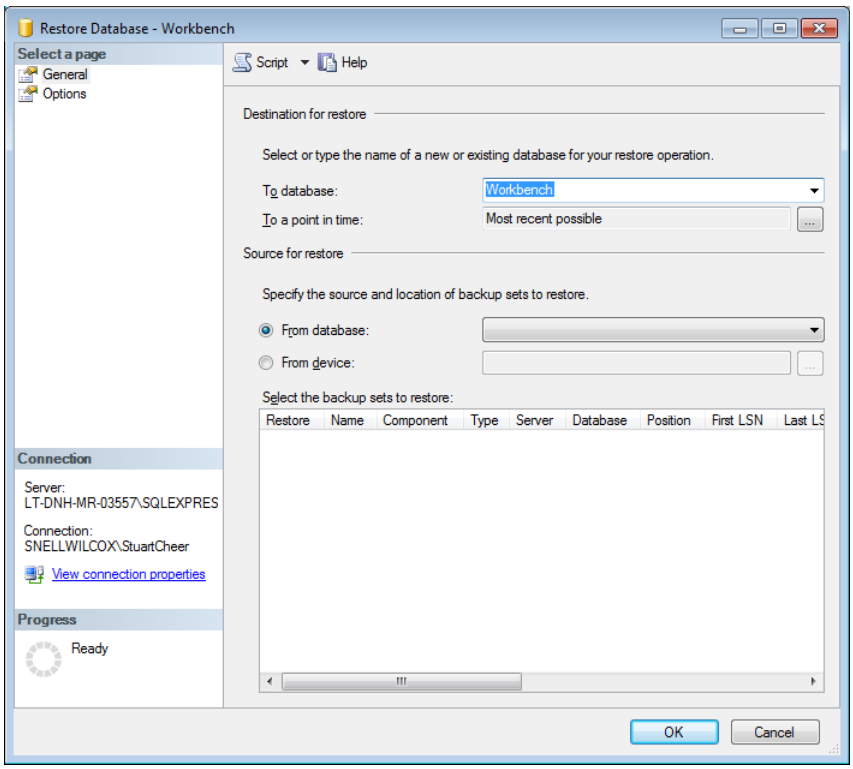

Fig 201. Select Database to Restore

5. In the **Source for restore** section, select **From device** and click the ... (browse) button.

   The **Specify Backup** dialog box displays.

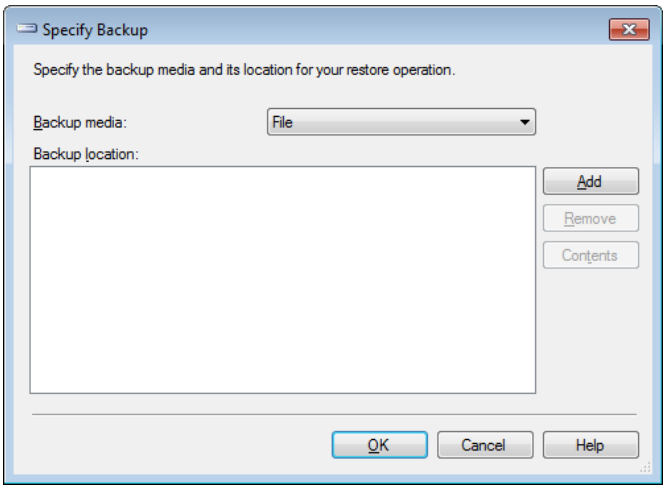

Fig 202. Select Backup File

6. Click **Add**.
7. Locate the backup file, select it and click **OK**.
8. Click **OK**.
9. Check the checkbox to **Select the backup sets to restore**.
10. Select the **Options** page from the top-left of the screen.
11. Select **Overwrite the existing database** and **Leave the database ready to use…**(RESTORE WITH RECOVERY).

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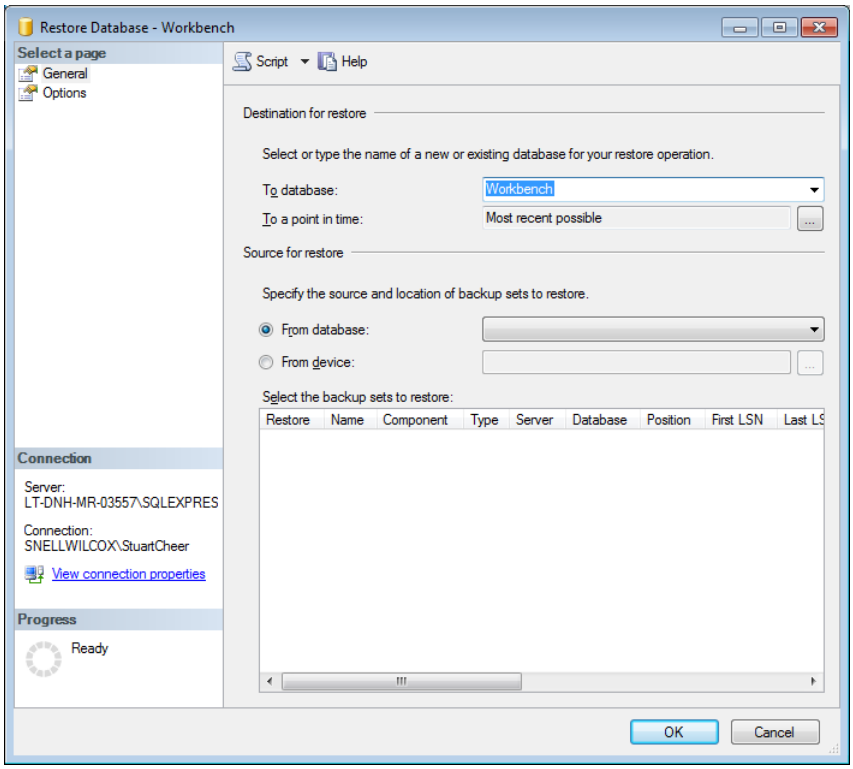

Fig 203. Restore Options

12. Click **OK**.
13. Start Workbench, the database needs to be updated. Fig 204. shows the initial screen.

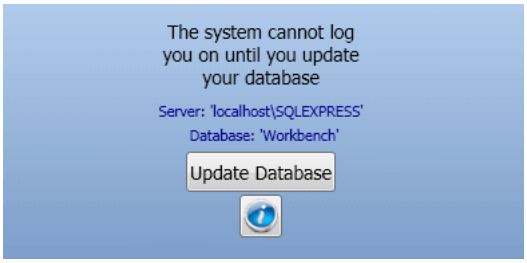
The system cannot log you on until you update your database
Server: 'localhost\SQLEXPRESS'
Database: 'Workbench'
Update Database

Fig 204. Update Database

To view the differences between the databases, click the button. The Database Analyzer displays, indicating the parts of the database that will change when the database is updated, see Fig 205.

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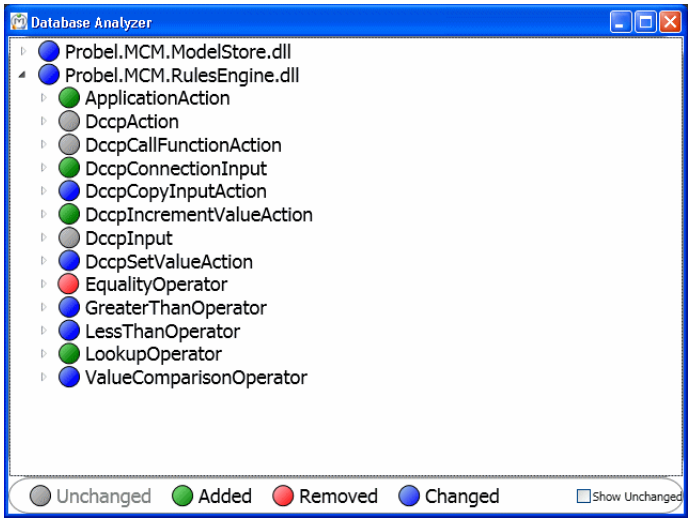

Fig 205. Database Analyzer

F.1.2 Backup a Database

A backup of the Workbench database should be kept.

To backup a database:

1. Make sure Workbench is not active.
2. Open SQL server management express and connect to the server.
3. Right click on the Workbench database and select **Tasks | Back Up...**

   The **Backup Database - Workbench** screen displays, see Fig 206.

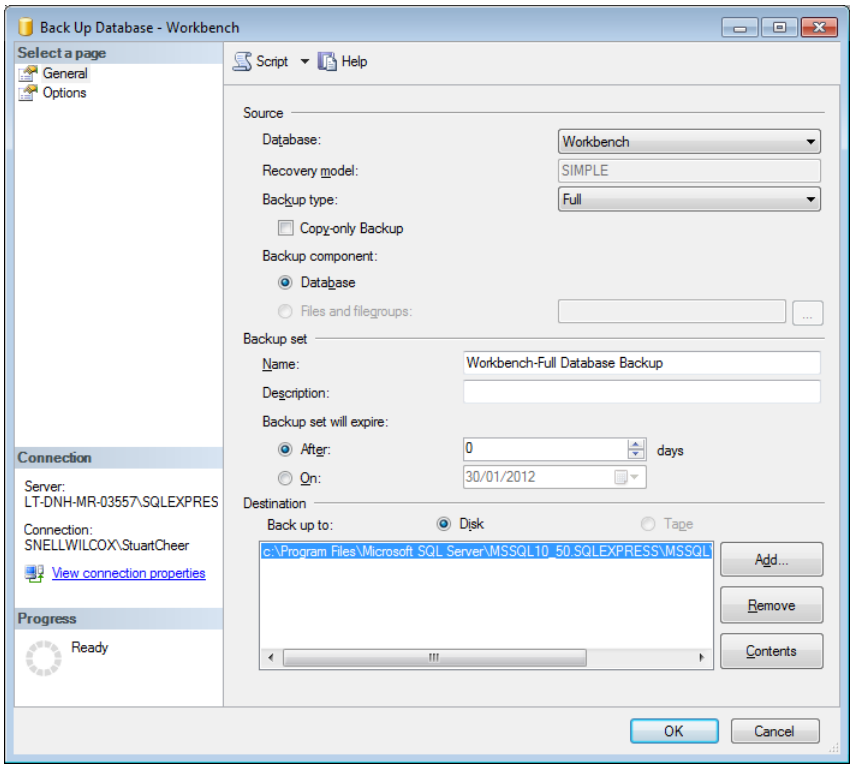

Fig 206. Backup Database

4. Select a database backup destination.
5. Click **OK**.

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F.2 SQLDBTool

The SQLDBTool is available from the Windows Start Menu:

Start | All Programs | Snell | SQLDBTOOL | SQLDBTool

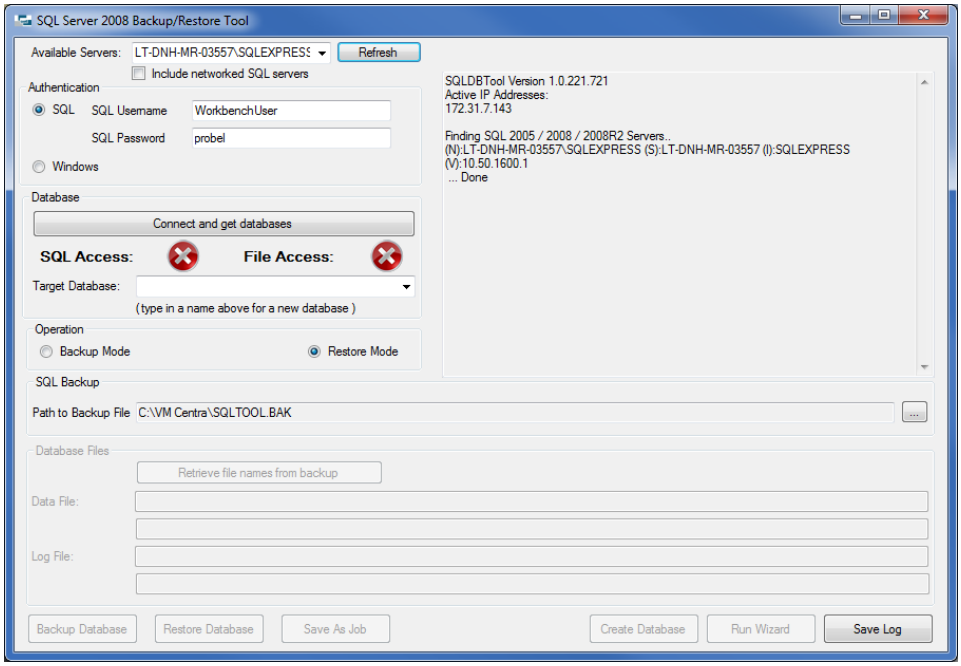

Fig 207. SQLDBTool Screen

1. Select the server name from the drop-down list at the top of the screen.
2. Click **Connect and Get Databases**.

F.2.1 Restore a Database

Note: Before restoring a database, ensure that the current database has been backed up first.

1. Ensure the Restore Mode radio button is selected.
2. Click **Retrieve file names from backup**.
3. Click **Restore Database**. When prompted to Overwrite existing database, click **Yes**.
4. When the restore is complete, a dialog box displays. Click **OK**.

F.2.2 Backup a Database

1. Ensure the Backup Mode radio button is selected.
2. Browse to the path of where the backup files for the database are to be saved.
3. Click **Backup Database**.

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F.3 Aurora/Nebula Importer

This section describes how to import Aurora or Nebula configuration files from a legacy database into the current Workbench database.

To open Aurora/Nebula Importer, from the Windows Start menu browse to:

Start | All Programs | Snell | MCM | Utilities | Aurora Database Importer

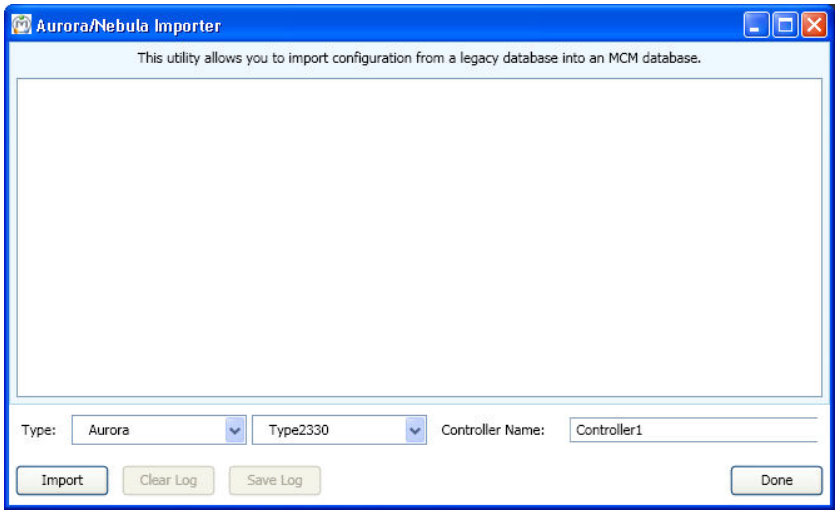

Fig 208. Aurora/Nebula Importer

F.4 Importing a Database

1. Select the type of database from the drop-down list: Aurora or Nebula.
2. Select the type of controller from the drop-down list: Type2330 or Type2450.
3. Type a Controller Name. If the controller already exists, a prompt displays inquiring whether to overwrite, use a default name, or cancel the import.
4. Click **Import**. Browse to the location of the legacy configuration file.

   Nebula files have the extension .ne1, .ne2 and so on. Aurora files have a .aur extension.
5. Click **Open**. The controller is imported into Workbench, see Fig 209.

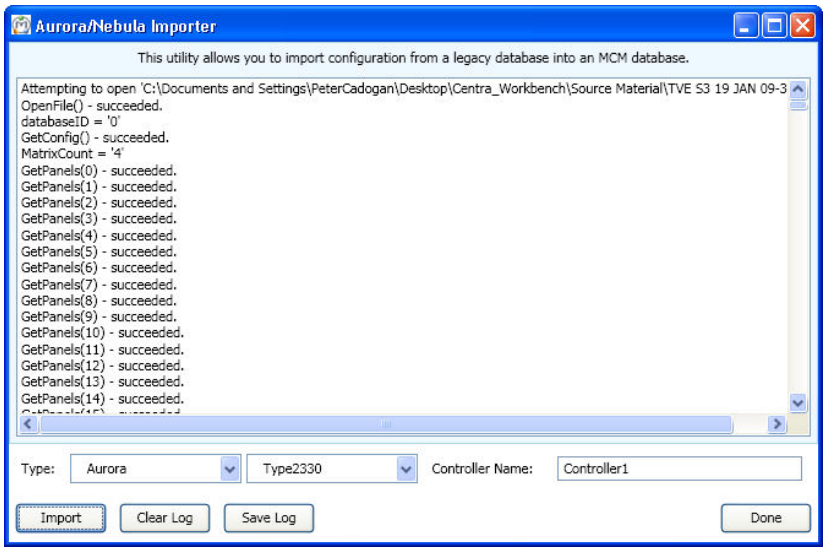

Fig 209. Aurora/Nebula Importer - Log File

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When the import is complete, the window lists all the items in the database that are imported.

6. To save the log, click **Save Log**.

   The imported controllers are listed in Workbench Configuration mode.

F.5 Imported Data

The following data is imported:

- Matrices
- Levels
- Sources
- Source Associations (if enabled in the legacy database)
- Destination Associations
- Salvos
- Panel configuration

Defaulted Data

- Destinations
- Source Associations (if disabled in the legacy database)
- Inhibits

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